

DNB Working Paper

No. 722 / July 2021

Trust in the ECB in turbulent times

Carin van der Cruijssen and Anna Samarina

DeNederlandscheBank

EUROSYSTEEM

Trust in the ECB in turbulent times

Carin van der Cruijssen and Anna Samarina *

* Views expressed are those of the authors and do not necessarily reflect official positions of De Nederlandsche Bank.

Working Paper No. 722

July 2021

De Nederlandsche Bank NV
P.O. Box 98
1000 AB AMSTERDAM
The Netherlands

Trust in the ECB in turbulent times¹

Carin van der Cruijssen^a, Anna Samarina^{a,b}

^a De Nederlandsche Bank, The Netherlands

^b University of Groningen, The Netherlands

July 2021

Abstract

Trust in the European Central Bank (ECB) is vital. Although it is important to study its level, drivers and effects especially in turbulent times, little is known about trust in the ECB during the COVID-19 pandemic. We use the pilot data from the ECB Consumer Expectations Survey during 2020-2021 to shed light on trust in the ECB during the pandemic. This is a new rich monthly dataset covering six key euro area countries. We find that there is ample room to improve consumers' trust in the ECB. Trust is the lowest in Italy and Spain. Moreover, personal COVID-19 experiences play a role: respondents who reduced the number of hours worked due to COVID-19 have lower trust in the ECB than those with unchanged working hours. Trust in the ECB varies also within countries. It is highest among males and people with a good financial situation. It increases with financial knowledge, education, income, wealth, and trust in other people. Trust in the ECB and financial knowledge contribute to better anchoring of consumers' inflation expectations three years ahead around the ECB's medium-term inflation goal. Lastly, we show that consumers with higher inflation expectations are more likely to increase their household spending and buy a large item.

Keywords: European Central Bank; trust; financial knowledge; COVID-19 crisis; inflation expectations; spending decisions

JEL Codes: D83; E58; E52; G53

¹ We thank Maurice Bun, Dimitris Georgarakos, Geoff Kenny, Maarten van Rooij, and the participants of the CES ISCG teleconference and the ECB CES Research Seminar for helpful comments and suggestions. The views expressed do not necessarily reflect the official views of De Nederlandsche Bank or the Eurosystem.

1. Introduction

Trust in central banks is vital. Especially in turbulent times, like the current COVID-19 crisis, it is important yet challenging to maintain trust. However, little is known about trust in central banks during the COVID-19 pandemic. We use new rich monthly microdata to shed light on trust in the ECB, its drivers and effects during the pandemic.

Central bankers recognize well the importance of trust in their institutions. For example, in the speech on the importance of trust for the ECB's monetary policy Isabel Schnabel (Member of the Executive Board of the ECB) said that *"The trust of citizens in the ECB and public support for the euro are essential for the effectiveness of our monetary policy and the independence of the central bank."* (Schnabel 2020). Ehrmann et al. (2013: 782) define citizens' trust in the central bank as *"...a belief that the central bank, as the agent in a principal-agent relationship, will deliver on its stated goals - in the case of the European Central Bank (ECB), price stability - to its principal (i.e., citizens)."*

Trust in central banks is essential for maintaining price stability – the primary mandate of most central banks – as money is a credence good and its value depends on trust in the central bank. High trust helps anchor inflation expectations around the central bank's inflation target. When inflation expectations are well-anchored, deviations of realized inflation from the target do not considerably affect the wage and price decisions of households and firms. This makes it easier to reach the inflation target, which may help build trust (a self-reinforcing process). Trust is also important for shielding central banks from political pressure; together with stable money, trust generates acceptance of central bank independence by the public at large.²

We add to the literature by studying trust in the ECB during the COVID-19 pandemic. For this purpose, we use the pilot microdata from the ECB Consumer Expectations Survey (CES) during April 2020 - March 2021. The CES is a novel monthly dataset launched in January 2020 with survey questions covering a number of areas, such as households' expectations, financial knowledge, income, spending, and credit access. From April 2020 onwards the survey also includes questions about the impact of COVID-19 on households' financial situation, working hours, and overall spending, as well as questions on trust in institutions. Such data gives a unique opportunity to research the effects of the COVID-19 pandemic on trust in the ECB. Moreover, it allows analyzing how trust in the ECB matters for anchoring of inflation

² Ehrmann and Fratzscher (2011) relate trust in the ECB to politicians' preferences. When people in their country have low trust in the ECB, politicians want the ECB to attach more weight to the national growth performance.

expectations in the euro area. Lastly, we use the CES data to examine the relationship between households' inflation expectations and intended spending behavior during the pandemic.

Our main findings can be summarized as follows. First, there is ample room to improve consumers' trust in the ECB. Trust in the ECB varies across countries and is the lowest in Italy and Spain when compared to Netherlands, Germany, France, and Belgium. Moreover, personal adverse COVID-19 experiences are detrimental for trust: respondents who reduced the number of hours worked due to COVID-19 have lower trust in the ECB than those whose working hours did not change. Trust in the ECB varies also within countries. It is highest among males and people with better financial situation. It increases with financial knowledge, education, income, wealth, and trust in other people. In addition, people who trust other EU institutions more, have also higher trust in the ECB. Domestic government policies aimed to minimize the impact of the COVID-19 crisis on consumers' economic situation as well as better country-specific macroeconomic conditions contribute to trust in the ECB. Second, trust in the ECB and financial knowledge facilitate better anchoring of consumers' inflation expectations 3 years ahead around the ECB's medium-term inflation goal. Lastly, inflation expectations matter for consumers' intended spending decisions. The higher inflation expectations are, the more likely it is that consumers will increase their household spending and buy a large item.

Our first contribution is in focusing on the impact of the COVID-19 pandemic on trust in the ECB. As far as we are aware and given the novelty of the topic, such analysis has not been done before. Prior studies show that the Global Financial Crisis (GFC) and the sovereign debt crisis in the euro area had a detrimental impact on trust in the ECB (Roth 2009; Wälti 2012; Ehrmann et al. 2013; Roth et al. 2014; Jonung and Roth 2019; Bergbauer et al. 2020). It is yet unclear how the world-wide pandemic has affected this trust. On the one hand, trust in the ECB may have risen thanks to the pre-emptive monetary policy measures taken to support bank lending to the real economy. On the other hand, national lockdowns, deteriorating economic situations, sluggish recovery, and increased uncertainty may have lowered trust in the ECB.

Recent studies on the effect of the pandemic on trust in institutions show that proactive behavior can result in higher trust. Bol et al. (2020) examine survey data from March - April 2020 on Western Europe and find that lockdowns increased trust in the government. Kye and Hwang (2020) use South Korean data and report that while trust in government improved due to proactive responses to the COVID-19 crisis, trust in judicature and the press decreased.

By looking at the role of personal experiences during the pandemic, we relate to studies showing that personal experiences matter for trust. For example, van der Cruysen et al. (2016)

find that Dutch consumers' trust in banks and in other people negatively depends on personal adverse financial crisis experiences, whereas these experiences are not significantly related to trust in the national central bank (De Nederlandsche Bank).

Our second contribution regards the use of the CES pilot data, collected on a monthly basis for six euro area countries: Belgium, France, Germany, Italy, Spain, and the Netherlands. Previous studies on trust in the ECB primarily work with data at a lower frequency. Most of them use the semi-annual Eurobarometer survey data (e.g. Hudson 2006; Fisher and Hahn 2008; Wälti 2012; Bursian and Faia 2018), a single Eurobarometer survey (Kaltenthaler et al. 2010) or a one-shot survey for a specific country (van der Cruysen and Eijffinger 2010). While some studies research trust at the country level (Fisher and Hahn, 2008; Wälti 2012; Albinowski et al. 2014; Jonung and Roth 2019), we add to the literature that examines trust in the ECB at the individual (household) level and combines micro with macro data (Ehrmann et al. 2013; Bursian and Fürth 2015; Farvaque et al. 2016). Thereby, we are able to research how consumers' trust in the ECB depends on sociodemographic as well as macroeconomic factors.

Prior studies consider sociodemographic and macroeconomic factors as key drivers of trust in the ECB. Ehrmann et al. (2013) use data for 1999-2010 and find that during the GFC trust fell due to macroeconomic deterioration, more generalized loss of confidence in Europe and European institutions, and the severity of the banking sector problems. In addition, trust is positively associated with being male, older, married, as well as with having a higher level of education, a center-right political orientation, and a higher life satisfaction. Trust is also negatively related to unemployment rate, inflation, and lower stock market returns. Bursian and Fürth (2015) show that trust depends positively on real GDP growth and negatively on relative government debt, bond yields spread and unemployment rate, especially during the crisis. The latter suggests that people care about unemployment and hold the ECB accountable for developments not directly linked to its mandate. Education is also an important driver of trust. Moreover, individuals with a left political orientation, females, retirees and unemployed have a relatively low level of trust in the ECB. Farvaque et al. (2016) report likewise that trust in the ECB positively depends on consumers' education level and income, it is relatively high for men, employed, people with a center-right political orientation and optimistic expectations about the economic situation. Additionally, expected inflation matters for trust, whereas people in countries with high fiscal deficit and debt have relatively low trust in the ECB.

Our third contribution is in examining the importance of financial knowledge for trust. A unique feature of the CES data is that it includes both self-assessed financial knowledge and

four questions to determine actual knowledge. We add to the few prior studies on the role of knowledge for trust in the ECB. Based on a 2007 survey among Dutch consumers, van der Cruijssen and Eijffinger (2010) find that people who knew the ECB before reading a definition in the questionnaire have more trust in the ECB than people who did not know the ECB. In addition, higher self-assessed economic knowledge goes along with a higher indirect measure of trust in the ECB (the extent to which people feel the ECB is safeguarding price stability). Ehrmann et al. (2013) use 1999-2010 Eurobarometer data for 27 EU countries and find that trust in the ECB depends positively on knowledge of the ECB (having heard of the ECB), a relationship which was particularly evident during the GFC. Using 2011 survey data, Hayo and Neuenkirch (2014) show that Germans' trust in the ECB is positively associated with objective and subjective knowledge about monetary policy and consumers' wish to be informed about the ECB. Objective knowledge matters more than subjective. Regarding objective knowledge, the authors find that trust depends positively on knowledge about the ECB's mandate and independence and not on general monetary policy knowledge. The larger the number of media sources people use to inform themselves about the ECB, the lower is their trust. Mellina and Schmidt (2018) use survey data from 2016 and 2017 to study Germans' trust in the Bundesbank and the ECB. They find that trust in these central banks depends positively on knowing that price stability is the main goal of the Bundesbank and the ECB. This concept of knowledge is measured with an open-ended question about the objectives of the Bundesbank and the ECB. Kaltenthaler et al. (2010) also find a positive effect of knowledge about the EU and having heard of the ECB. Lastly, using a random controlled trial among Dutch consumers, Brouwer and de Haan (2021) find that average trust in the ECB does not depend on communication about the ECB's instruments. Trust is the same for the participants who only received information about the ECB's goal and for those who also received information about how the ECB tried to achieve this goal. However, their inflation expectations differ, suggesting that communication helps in anchoring inflation expectations.

Last, we contribute to the literature by studying the relationship between trust in the ECB and consumers' inflation expectations. This is an important topic, as inflation expectations are at the core of monetary policy. When there is a positive link between trust in the ECB and anchoring of inflation expectations around the ECB's inflation objective, trust can increase the ECB's ability to deliver on its mandate. In contrast, low trust would make it more challenging for the ECB to reach its inflation objective (see Section 2 for discussion).

Empirical research on the link between trust in the ECB and inflation expectations is still in infancy. While there is an increasing number of studies on consumer inflation expectations using survey data on euro area consumers (e.g. Forsells and Kenny 2004; Dias et al. 2010), most of them do not consider trust in the ECB as a potential driver of these expectations. We add to the few studies that do include trust in the ECB. Rumler and Valderrama (2020) use 2013 data on Austrian consumers and report that higher trust in the ECB, the Oesterreichische Nationalbank, and their ability to maintain price stability goes along with lower inflation expectations at the one- and 5-10-years horizons. However, people with high trust in the ECB are less certain about their inflation expectations than people with low trust. Christelis et al. (2020) use data from the Dutch CentERpanel for 2015, characterized by an environment of low interest rates and low inflation, and find that higher trust in the ECB reduces uncertainty about future inflation and helps to anchor consumers' inflation expectations 12 months ahead around the ECB's definition of price stability. This suggests that in the conditions when conventional monetary policy tools become less effective, trust in the ECB can be an important factor. Finally, Dräger and Fritsche (2013) use survey data collected among inhabitants of Hamburg and report that trust in the ECB has no effect on their inflation expectations.

Our paper focuses on analyzing inflation expectations 3 years ahead (both quantitative and qualitative), as this is suitable for evaluating the anchoring of expectations around the ECB's inflation goal, defined in a medium-term horizon. In a similar vein, Mellina and Schmidt (2018) use a qualitative measure of medium-term inflation expectations and find that higher trust in the ECB and the Bundesbank increases the likelihood that a consumer expects unchanged prices and reduces the likelihood that he/she expects prices to rise. As a robustness check, we also consider inflation expectations 12 months ahead, in line with Christelis et al. (2020).

In our inflation expectations analysis, we also control for financial knowledge as various prior studies show that financially knowledgeable consumers have better anchored inflation expectations than others. Van der Crujsen and Eijffinger (2010) report that the likelihood that consumers have inflation expectations in line with the ECB's goal depends positively on their self-assessed economic knowledge. Based on a 2009 survey among Dutch consumers, van der Crujsen et al. (2015) find that public knowledge about the ECB's objectives is far from perfect but important, as it contributes to an individual's ability to form inflation expectations. In contrast, Mellina and Schmidt (2018) conclude that knowledge of the central bank's main goal does not matter for inflation expectations when trust in the ECB is included in the model. However, inflation expectations are negatively related to knowledge of stable prices (prices

going up slightly, up to about 2% a year) and knowledge of past prices (correct qualitative inflation perceptions). Rumler and Valderrama (2020) show that consumers with high inflation literacy – based on knowledge questions – have lower and more accurate inflation expectations, but they are less certain about their inflation expectations than people with low inflation literacy. Christelis et al. (2020) find that the effect of trust on inflation expectations does not depend on knowledge of the ECB’s inflation goal.

Studying the drivers of inflation expectations is highly relevant. Modern macroeconomic theory predicts that household behavior – such as buying durable goods, saving, and borrowing decisions – depends on their inflation expectations (Woodford 2005; Gali 2008; Sims 2009). Household decisions affect aggregate demand, and thereby economic activity and realized inflation. Managing household inflation expectations is therefore a key task of central banks. Some empirical evidence shows that households’ financial decisions often depend on their expectations. For instance, households with high inflation expectations are more likely to purchase durable goods (D’Acunto et al. 2016), consider major purchases (Duca-Radu et al. 2020), and borrow through fixed-rate mortgages, but are less likely to invest in long-term bonds (Malmendier and Nagel 2016). Most respondents in the experiment of Armantier et al. (2015) act on their inflation beliefs, while their investment choices are in line with economic theory. However, how the agents’ actions change when they revise their inflation expectations depends crucially on whether/how they revise their broader economic outlook (Coibion et al. 2019; Candia et al. 2020). In a last part of our analysis we use the CES data to study how respondents’ inflation expectations influence their expected spending decisions during the pandemic.

The rest of the paper is structured as follows. Section 2 discusses theoretical literature on trust in the central bank. Section 3 describes the data and offers stylized facts. Section 4 analyzes the determinants of trust in the ECB. Section 5 studies the impact of trust in the ECB on inflation expectations, while Section 6 examines the relation between consumers’ inflation expectations and intended spending decisions. Section 7 concludes with a summary and policy implications.

2. Theoretical background

This section discusses theoretical underpinnings of trust in the central bank, and specifically, in the ECB, based on three relevant strands of literature. We use these theories to explain the concept of trust in the central bank, the mechanism of trust formation, as well as the channels through which trust can affect economic decisions and monetary policy transmission.

The first strand refers to the institutional theory, which defines trust as a sub-category of risk – it is based on considerations that a person applies when placing a bet and can be calculated using probabilities (Hudson 2006). In the context of institutional trust, the person considers how much he/she trusts the central bank to fulfill its role in a satisfactory manner. That is, the i 'th person trusts the central bank if the perceived probability p that it will carry out its job to a satisfactory degree is not less than some critical level: $p_i \geq p_i^*$.

Following Hudson (2006), the individual's trust in the central bank (T_i) is assumed to be a function of his/her personal socio-economic characteristics (X_i) and the quality of this institution (Q): $T_i = f(X_i, Q)$. The quality of the institution is linked to its reputation. People who had unsatisfactory experience with the central bank and perceive its reputation as poor are less likely to trust it. Socio-economic characteristics play an important role, too. First, people with different backgrounds may have different experiences with the central bank. Second, those who experience a worsening of their personal situation, e.g. due to job loss, may have a negative attitude towards the central bank as they may blame their misfortunes on the national government or the central bank who formulate economic policy. Third, trust in the central bank varies between individuals depending on their general knowledge as well as specific knowledge of this institution. The knowledge of the central bank can be direct and indirect, the latter comes mainly through the media. Education, age, and income are the main factors determining personal knowledge and trust attitudes. It is expected that more educated, older and wealthier people exhibit greater degrees of institutional trust (Hudson 2006).

The second strand of literature relies on the principal-agent theory to model trust in the central bank. In general terms, trust is defined as a belief or a perception by one party (a principal) that the other party (an agent) to a particular transaction will not cheat (Knack 2001). The principal-agent approach has been applied to explain trust in and accountability of the ECB (Elgie 2002; Ehrmann et al. 2013) and used in design of optimal contracts for central bankers (e.g., Barro and Gordon 1983; Walsh 1995).

In the principal-agent framework, the principal (government, the public) delegates monetary policy implementation to the agent (central bank) with expectation that the latter will act in a way which is consistent with the initial preferences of the former (Elgie 2002). In our context, the ECB was delegated the sole authority to conduct monetary policy with a primary objective of maintaining price stability in the euro area, defined in terms of year-on-year HICP inflation rate of 'below, but close to 2%'. The key assumption is that the principal and the agent

have the same preferences over inflation and output fluctuations (Walsh 1995), although the central bank exhibits more inflation aversion than the representative agent.

In a typical principal-agent model, the principal prefers an extremely self-interested central bank. That is, as a non-profit institution established to serve the public, the central bank has in its own interest to deliver on its mandate. Trust in the central bank is also related to its credibility (Albinowski et al. 2014). The failure to deliver on the mandate – price stability – results in the loss of reputation or credibility by the central bank, damaging the public's trust in it. The risk of receiving such 'punishment' and the time it takes to restore the lost reputation motivate the policymaker to stand by the rule: forego the short-term benefits from higher inflation in order to ensure gains from low average inflation over the long term (Barro and Gordon 1983).

These considerations are incorporated in the optimal contract design between the principal and the agent. Monetary policy games with asymmetric information may complicate the optimal contract, as the central bank possesses private information which is not available to the agent. This private information can concern the structure of the economy (e.g., an estimate of potential output or the natural interest rate) or the feature of the central banker (e.g., hawkish or dovish) about which the private sector lacks information (Walsh 1995). Due to this information advantage, the central bank may decide to occasionally deviate from achieving its mandated objective, which may come at the cost of lost public trust.

The third relevant strand of literature shows theoretically how trust in the ECB impacts economic decisions, and thereby affects the monetary policy transmission and macroeconomic performance. The prominent study in this area is by Bursian and Faia (2018). In contrast to the principal-agent approach, their strategic interaction game assumes that trust in the central bank depends also on the preferences of the trustor (degree of betrayal aversion) apart from those of the trustee (inflationary or anti-inflationary), and it focuses on moral hazard with uncertainty over actions, rather than asymmetric information with uncertainty over types.

Bursian and Faia (2018) construct a monetary model with a trust game, where economic agents with heterogeneous degrees of betrayal aversion interact strategically with the central bank who has ex post stochastic incentives toward moral hazard, while on average acting under an anti-inflationary Taylor rule. Agents are uncertain about policy actions and form conditional expectations. The agents' choice to trust the central bank depends on the costs of betrayal and on the likelihood that the central bank will deviate ex post. The betrayal costs appear through households' decisions to invest in safe assets when trust falls. The trust itself depends on the

business cycle and past policy outcomes, which are measured in terms of past inflation gaps – deviations of realized inflation from the target – and serve as signals.

Higher past inflation gaps increase uncertainty and impair the ability of households to predict future policy actions, making the central bank less trustworthy. Like other behavioral elements or information frictions impacting beliefs and risk attitudes, trust affects the way agents perceive future uncertainty, with implications for their precautionary savings.

Bursian and Faia (2018) show that due to contractionary shocks or deviating policy actions, trust in the ECB falls endogenously. A recession reduces the expected gains from coordination, increases risks of betrayal, and makes agents more cautious. First, agents require higher risk premia, their precautionary savings rise and consumption falls, amplifying the contraction. Second, as risk premia increase, the stochastic discount factor in the agents' utility function (the price of future contingencies) co-moves less with the policy rate. It impairs the central bank's ability to affect future expectations and affects the slope of the forward-looking Phillips curve. This hinders the monetary policy transmission mechanism, since a change in the policy rate has weaker effects on future consumption and inflation expectations.

In such circumstances improving trust can facilitate the economic recovery (Schmitt-Grohé and Uribe 2012; Bursian and Faia 2018). Agents who trust the central bank more, require lower risk premia to achieve certainty equivalence, and this stimulates consumption. Firms price the uncertainty surrounding future profits less, which boosts output growth. This makes the monetary policy transmission more effective. An increase in trust reduces inflation expectations and anchors them better, as agents expect the central bank to stay closer to its inflation target. In addition, higher trust reduces precautionary savings, which improves the inflation-output trade-off, by increasing the output gap for a given inflation gap. As a result, expected inflation falls, despite the rise in aggregate demand. The central bank responds to the fall in inflation expectations by loosening policy stance. Thus, an increase in trust further facilitates the monetary transmission. Empirically, Bursian and Faia (2018) use a VAR model where trust is proxied by answers to Eurobarometer surveys and find that a positive shock to trust in the ECB increases real GDP, lowers inflation and lowers nominal interest rate in the euro area.

3. Data

3.1. Description of Consumer Expectations Survey

Our paper uses the anonymized microdata collected during the pilot phase of the ECB CES. The CES is a new monthly online survey, intended to complement the Household Finance and

Consumption Survey (HFCS) with high frequency data on consumer expectations. The CES is internet-based and organized by a common centrally managed platform which allows access to all survey data and synchronized data collection across countries. The pilot survey has been launched in January 2020 and runs on a monthly basis. The pilot sample covers six key euro area countries: Belgium, France, Germany, Italy, Spain, and the Netherlands. The sampling frame for the four largest countries (France, Italy, Germany and Spain) is mixed – 75% of the sample is drawn using random probability methods and 25% by non-probability methods. For Belgium and the Netherlands 100% of sampling is conducted via non-probabilistic recruitment from existing data panels. The CES is of statistical quality that is at least as high as other similar internet-based surveys. It is broadly representative of the euro area population. The CES consists of a monthly module with core, background and recruitment questionnaires, and it is complemented with a quarterly questionnaire.

The core questionnaire covers households' expectations in several areas, such as general macroeconomic conditions in the country of residence (inflation, unemployment rate, economic growth, interest rates), housing markets (house prices, housing as an investment), households' own financial situation, income, spending, and credit access. From wave 4 (April) onwards the core questionnaire also includes COVID-19 related questions (concerns about the impact of coronavirus on own country's economic situation, own health, own financial situation, and the world economy; change in behavior due to coronavirus with respect to social activities, travel, hours worked, and overall spending) as well as questions on trust in institutions. The quarterly and background modules include additional questions about households' expenditures, savings, employment, borrowing, risk attitudes, financial knowledge, and income, among others.

The CES panel dataset is unbalanced. Every month new respondents are being added to reach the target sample size of the pilot, set to 2,000 respondents per country per survey round for the four largest euro area countries and to 1,000 per country per survey round for the remaining two countries (Belgium and the Netherlands). Thus, some respondents might not be present in all waves due to being added or dropping out in later rounds.

We use the data for waves 4-15, which were conducted in April 2020 – March 2021. We discard waves 1-3 as in those months questions about trust in institutions (including the ECB) and the impact of COVID-19 were not included in the survey. The total number of distinct respondents who participated in 12 analyzed waves of the CES pilot by completing at least one core and quarterly module is 18,492. Across individual countries this number ranges between 2,031-2,113 for Belgium and the Netherlands and 3,204-3,816 for the other four countries. The

dropout rate (percentage of respondents who dropped out in later rounds) is around 22% for the full panel.

For calculation purposes the CES data provides several types of weights. We use blended weights, which are the default weights that should be applied when the whole sample is used (combined probability and non-probability samples). Blended weight gives the number of individuals (adults 18+) in the population each person in the pooled sample represents. For each wave and module, the CES blended weights sum up to the population size within each country and to the total population of the six CES countries. Blending means that the base weights of probability and non-probability samples are calibrated jointly to the marginal distributions.

3.2. Construction of variables

Using the CES dataset, we construct variables related to five key domains of interest in our analysis: trust in the ECB, consumers' COVID-19 experiences, financial literacy, inflation expectations and expected spending. In addition, we include variables that capture respondents' personal characteristics as well as country-specific macroeconomic and pandemic conditions. Table A.1 in Appendix A describes all variables, their construction, and summary statistics.

Trust in institutions

The question related to trust in institutions is included in the core module and formulated as follows: *“How much do you trust each of the following institutions and organizations? Instruction: Please rate your level of trust on a scale from 0 to 10, where 0 means you have no trust at all in the institution and 10 means you trust it completely.”* There are four items in the survey: *“the European Central Bank”, “the European Commission”, “the European Parliament”,* and *“the United Nations”*. The order of items is randomized. For each institution a brief explanatory note is provided. The following information is included about the ECB: *“Central bank for the euro, responsible for monetary policy within the Eurozone.”* We construct a discrete variable *trust in the ECB*, which is measured on a scale from 0 ‘no trust at all’ to 10 ‘complete trust’. Trust in the ECB is set at missing for respondents who answered: *“I do not know”*. We construct similar variables for trust in the European Commission (EC) and in the European Parliament (EP) in order to test whether trust in the ECB reflects a more general evolution of trust in the European institutions.

COVID-19 experiences

We capture respondents' COVID-19 experiences related to their behavioral changes due to COVID-19. The corresponding survey question is: "*In the last month, have you changed your behavior in any of the following areas because of concerns about the coronavirus (COVID-19)?*" We focus on the area '*the number of hours you work per week*' as it is likely to reflect the abrupt changes in households' work and income situation due to the pandemic. Based on this question we construct three dummy variables – *COVID-19: hours worked decreased*, *COVID-19: hours worked increased*, and *COVID-19: hours worked unchanged* (reference category). The dummies take value 1 for respondents who reduced, increased, or experienced no change in past number of hours worked in the last month, respectively, and 0 otherwise. In a similar way we construct three dummy variables to capture the expected change in future hours worked in the next three months, which we include as a robustness check.

In addition, we control for the presence and adequacy of government support during the COVID-19 pandemic in order to test how policies aimed to alleviate the impact of COVID-19 on consumers' economic situation contribute to trust in the ECB. Two questions related to this topic were included in the core module. The first one was asked in waves 6 (Jun 2020) and 11 (Nov 2020) and covers the following areas of government support: payment for lost earnings, mortgage, other loans, rent, expenses, childcare/care of dependents, emergency loan access, indirect support for employer, business, and other. We construct a dummy variable *COVID-19: government support*, which equals 0 if the respondent received no support and 1 if he/she received support in at least one of the listed areas. The second question concerns the adequacy of government support and was asked in waves 7-10 (Jul-Oct 2020) and 12-14 (Dec 2020-Feb 2021). Based on the question "*Governments are taking financial support measures in response to the coronavirus (COVID-19) outbreak. How do you rate the adequacy of these measures for your household's financial situation?*" we construct the variable *COVID-19: adequacy government support*, which can take discrete values from 0 'very poor' to 10 'very good'.

Financial knowledge

Next, we construct both self-assessed and actual financial knowledge. As a baseline, we use a discrete variable for *Self-assessed financial knowledge*, based on answers to the question: "*How knowledgeable do you consider yourself on financial matters?*". This variable can take one of the four values: 1 = not knowledgeable, 2 = more or less knowledgeable, 3 = knowledgeable, 4 = very knowledgeable. *Actual financial knowledge* is based on answers to four knowledge

questions related to interest compounding, real rate, and risk diversification (see Table A.3. in Appendix A). The first three questions are developed by Lusardi and Mitchell (2011) and widely used in surveys' design (Lusardi and Mitchell, 2014). Actual financial knowledge ranges between 0 (all four knowledge questions answered wrong and/or "I do not know" and/or skipped) and 4 (all questions answered correct).

Inflation expectations

We construct two measures capturing qualitative inflation expectations. In the baseline analysis we use expectations 3 years ahead (*inflation expectations 3 years, qualitative*) and in the robustness analysis - 12 months ahead (*inflation expectations 12 months, qualitative*). Qualitative inflation expectations 12 months/3 years ahead are constructed from responses to the question: "*The next few questions are about future changes in prices in general in the country you currently live in. **Looking ahead to 12 months from now**, what do you think will happen to prices in general?*" and "*Please think further ahead to <survey month year+2>. What do you think will happen to prices in general in the country you currently live in over the 12-month period **<between survey month year+2 and survey month year+3>?***". Qualitative expectations variables can take five values: 1 = prices will decrease a lot, 2 = prices will decrease a little, 3 = prices will be exactly the same (that is 0% change), 4 = prices will increase a little, and 5 = prices will increase a lot.

In addition to qualitative metrics, we construct two quantitative ones: *inflation expectations 3 years, quantitative* and *inflation expectations 12 months, quantitative*. Quantitative inflation expectations 12 months/3 years ahead are taken from responses to the survey questions: "*How much [higher/lower] do you think prices in general will be **12 months from now** in the country you currently live in? Please give your best guess of the change in percentage terms.*" and "*By about what percentage do you expect prices in general in the country you currently live in to [increase/decrease] over the 12-month period **<between survey month year+2 and survey month year+3>?** Please give your best guess of the change in percentage terms.*" Inflation expectations are put at zero for people who answered to the prior question: "*prices will be exactly the same (that is 0% change)*". Quantitative inflation expectations are winsorized at the 5th and 95th percentiles to deal with extreme values.

Next, we construct variables that capture whether inflation expectations are well-anchored, using probability anchoring and level anchoring. These two approaches are commonly used in the literature to capture how close inflation expectations are to the level desired by monetary

policymakers (see e.g. Grishchenko et al. 2019; Galati et al. 2020). In the first approach, we consider the probability of inflation expectations being close to target and create two dummy variables for *well-anchored inflation expectations* that equal 1 if inflation expectations 3 years ahead are well-anchored and 0 if they are not. Following van der Crujsen and Eijffinger (2010), we define inflation expectations to be well-anchored if they are in line with the medium-term inflation goal of the ECB. The ECB's inflation goal according to its monetary policy strategy applicable during our sample period, was to keep inflation 'below, but close to 2%'.³ As the precise meaning of 'below, but close to 2%' is not perfectly clear, we construct two measures: *well-anchored inflation expectations 3 years: strict* and *well-anchored inflation expectations 3 years: loose*.⁴ In line with the approach of van der Crujsen and Eijffinger (2010), for our strict measure we use a range of [1.8%, 2%], that is we judge inflation expectations between 1.8% and 2% to be an accurate interpretation of the ECB's medium-term inflation goal. This holds for 11% of the respondents. However, one may argue that a broader range can adequately capture inflation expectations that are in line with the ECB's goal. Therefore, we also use a loose range for well-anchored inflation expectations that remain below, but close to 2%: [1.5%, 2%]. In this case, 15% of the respondents have well-anchored inflation expectations.

In the second approach, we consider the deviation of the level of inflation expectations from target. We construct an *inflation expectations gap 3 years*, measured as the absolute deviation of quantitative inflation expectations 3 years ahead from 1.9%.⁵ According to Rostagno et al. (2019), the number 1.9% exemplified the ECB staff's reading of the 2003 'below but close to 2%' and served as the staff's working definition of the ECB's medium-term policy aim (until the adoption of the new monetary policy strategy on 8 July 2021). We construct three similar variables for anchoring of inflation expectations 12 months ahead, which are used in the additional analyses.

³ According to the ECB's monetary policy strategy applicable until 8 July 2021, an inflation rate above 2% was not in line with the ECB's medium-term inflation goal, hence we do not judge inflation expectations above 2% to be well-anchored. The ECB's new monetary policy strategy, announced on 8 July 2021, has adopted a symmetric 2% inflation target over medium term, meaning that negative and positive deviations of inflation from the target are equally undesirable (<https://www.ecb.europa.eu/press/pr/date/2021/html/ecb.pr210708~dc78cc4b0d.en.html>). Since our sample period ends in March 2021, that is before the strategy review was finalized, we take into account in our modelling of well-anchored inflation expectations only the definition of price stability based on the monetary policy strategy applicable before July 2021.

⁴ An advantage of using this approach is that it provides an elegant way to deal with extreme answers.

⁵ Alternatively, we construct two other inflation expectations gaps, measured as absolute deviation of inflation expectations from a strict ([1.8%, 2%]) or a loose range ([1.5%, 2%]). The inflation expectations gap is zero for inflation expectations within these range, while deviations outside the range are computed as a difference of inflation expectations from a lower or upper bound of the range. The estimation results using these two measures are very similar to the ones for inflation expectations deviation from 1.9% (results available on request).

Expected spending

We construct two variables capturing households' expected future expenditures. First, *intention to buy a large item* is a dummy variable that is 1 in case the respondent plans to purchase a large item in the next 12 months and 0 for respondents without such a plan. Large item includes: i) a house/apartment, ii) a car or other vehicle, iii) a home appliance, furniture or electronic items (incl. gadgets), iv) a holiday, v) luxury items, including jewelry and watches, and vi) another major item, not listed above. Second, *expected household spending* is constructed based on the question: "During the next 12 months, how do you expect your household spending on all goods and services to compare with your spending in the past 12 months?" This variable can take five values: 1 = will decrease a lot, 2 = will decrease a little, 3 = will remain exactly the same (that is 0% change), 4 = will increase a little, and 5 = will increase a lot.

Personal characteristics

We construct several variables to control for respondents' personal characteristics. *Male* takes the value 1 for male, 0 for female. Age is captured by four dummy variables representing the following age groups: 18-34, 35-54, 55-70, 71 and over. The variable *education* can take three values: 1 = primary or lower secondary education/no education, 2 = upper secondary education/post-secondary non-tertiary education, and 3 = tertiary education/short-cycle non-tertiary education. Based on answers about total combined net of tax household income, we construct dummy variables capturing respondents' income in four possible ranges (see Table A.1. in Appendix A), and for reported household income unknown. We control for employment status using a variable *employed* that is 1 when respondents are working full- or part-time, and 0 if they are temporarily laid off, on extended leave, or have no job.

In addition, we include a dummy variable *homeowner without mortgage* as a proxy for wealth. Further, we construct three dummy variables to capture respondents' past own financial situation based on the question: "Do you think your household is financially better off or worse off now than it was 12 months ago?". These variables equal 1 if the answer is better, same, and worse, respectively, and 0 otherwise. Similarly, we construct variables for future own financial situation. The dummy variable *liquidity unconstrained* is based on the yes (1)/no (0) answer to the question: "Suppose you had to make an unexpected payment equal to 1 month of your household income. Would you have sufficient financial resources to pay the entire amount?". Lastly, we construct a variable for *trust in others* which takes discrete values from 0 'you can't be too careful' to 10 'most people can be trusted'.

Country-specific conditions

General macroeconomic conditions are captured with year-on-year HICP inflation and Industrial Production Index (IPI) from Eurostat. In addition, we use the manufacturing Purchasing Managers' Index (PMI) from IHS Markit, available for all countries in our sample except Belgium. To capture country-specific pandemic conditions, we use three variables. These include monthly average of Government Response Stringency Index (source: Oxford COVID-19 Government Response Tracker, Blavatnik School of Government), new confirmed cases of COVID-19 per 1,000,000 people, and new deaths attributed to COVID-19 per 1,000,000 people (source: COVID-19 Data Repository by the Center for Systems Science and Engineering at Johns Hopkins University). We have adjusted the latter two variables such that they reflect new confirmed cases and deaths per 100,000 people. All macroeconomic and pandemic-related variables are lagged one month as respondents at the moment of filling in the survey have access to publicly known information from the previous month.

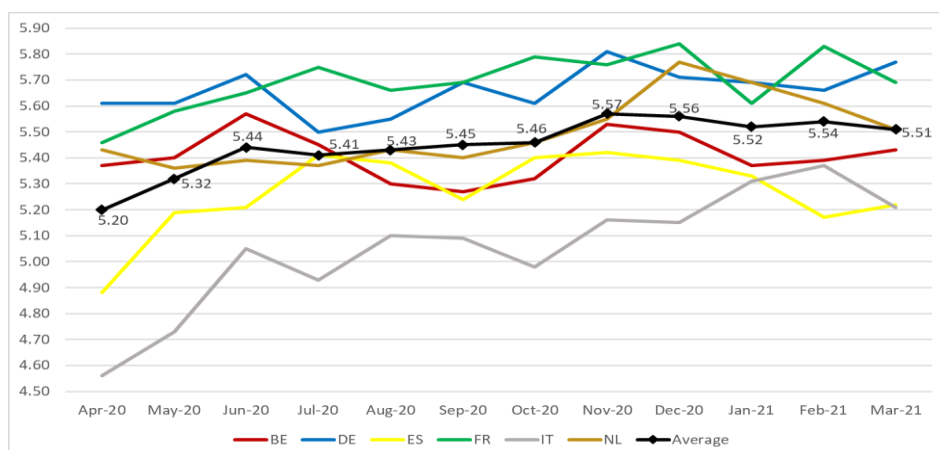
3.3. Stylized trends and statistics

We find that there is ample room to improve consumers' trust in the ECB. On average trust in the ECB was the lowest (5.2) in April 2020 and increased to 5.6 in November 2020, somewhat declining afterwards to 5.5 in March 2021 (see Figure 1). According to CES data, Germans and the French have the highest level of trust, followed by Dutch and Belgians, while Italians and Spaniards trust the ECB the least.⁶ Similar patterns are observed for trust in the EC and EP, which were both 5.4 on average across countries in March 2021 (tables available on request).

The most frequent were trust in the ECB responses with a value 5, 6 or 7, which together account for around 47% of all responses in March 2021 (Figure 2) as well as on average across all survey waves (see Figure A.1 in Appendix A). We do not observe any substantial shifts in the distribution of respondents' opinions about trust in the ECB across waves. The share of respondents with absolutely no trust is especially high in Italy and Spain. Note that Italians and Spaniards have a history of low trust in the ECB, as shown by the corresponding Eurobarometer data over the period 1999-2020 (see Figure A.2 in Appendix A).

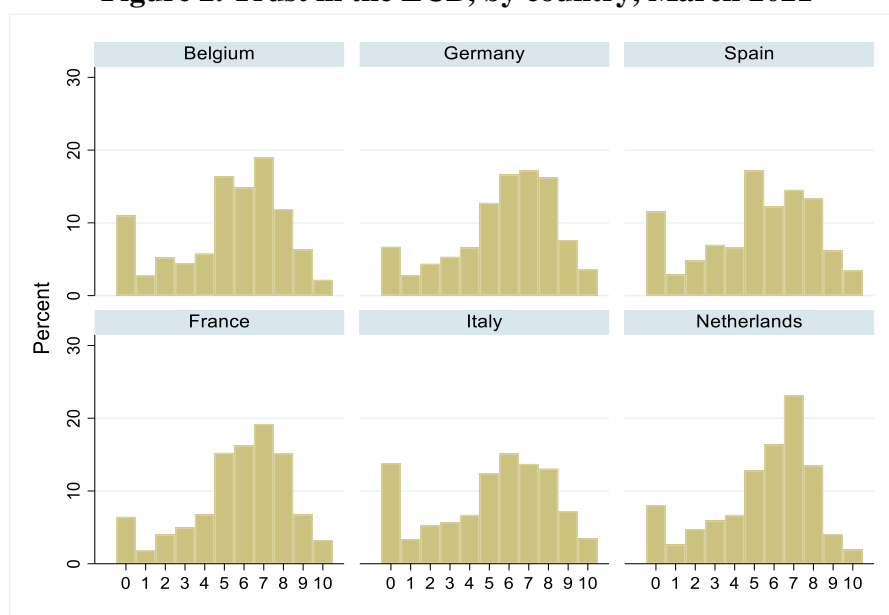
⁶ Interestingly, trust in the ECB has noticeably increased in Spain and Italy between April and June 2020. As the CES pilot data does not include the trust questions in survey waves before April 2020, we cannot compare with the trust numbers before the start of the pandemic. We conjecture that an increase of trust in the ECB in those countries by June 2020 could be related to improvement of the pandemic situation in summer 2020, easing of lockdown restrictions and more extensive government support. These factors could have affected consumers' moods and attitudes towards public institutions in general, thus indirectly also towards the ECB. We observe similar improvement in terms of Spanish and Italian trust in the EC and the EP (tables available on request).

Figure 1. Trust in the ECB during April 2020 – March 2021, from 0 (no trust at all) to 10 (complete trust)



Source: ECB CES pilot survey. Note: Weighted results. The number of observations is 118,232. See underlying Table A.4 (Appendix A).

Figure 2. Trust in the ECB, by country, March 2021



Source: ECB CES pilot survey, March 2021, unweighted results. Note: The number of observations is 9,812.

Responses for ‘absolutely no trust in the ECB’ account for about 9% of observations on average across all countries and waves, varying between 5% in Germany and 14% in Italy. Most respondents with absolutely no trust in the ECB are from Spain and Italy (56% of the sample), in the age groups 35-70 (76% of the sample) and in the lower half of the net income distribution (53% of those who do not trust ECB at all have net income below the sample mean). In terms of financial literacy, over 50% of respondents with absolutely no trust in the ECB have below-average financial knowledge (self-assessed as not knowledgeable and more or less knowledgeable; or those who answered correctly up to two knowledge questions). From the

group of respondents who have no trust in the ECB about 79% did not receive any COVID-19 government support and 68% perceived this support to be poor (answers 0-4). To check if this group of respondents strongly affects the results, as a robustness check we will estimate the drivers of trust in the ECB while excluding responses for trust equal 0.

On average over all analyzed countries and waves the mean expected inflation 3 years ahead was 3.3% and the median was 2%. Thus, median expected inflation by consumers was in line with the ECB's formulation of the price stability objective. Inflation expectations were the highest in Italy and the lowest in Germany. 0% inflation was chosen most often – by 28% of respondents. Using the strict definition, 11.0% of respondents on average had well-anchored inflation expectations 3 years ahead. In Belgium and the Netherlands this number was the highest (14.5-14.9%), whereas it was the lowest in France (9.6%).⁷ Table 1 shows the mean and median inflation expectations 3 years ahead as well as the share of well-anchored inflation expectations over 12 waves using the strict definition (Table A.5 in Appendix A reports inflation expectations in each wave). Answers for quantitative inflation expectations range between -100% and +100%; after winsorizing at the 5th and 95th percentiles the expectations lie between -2% and +15.5%. The corresponding statistics for inflation expectations 12 years ahead were very similar (see Table A.6 in Appendix A).

Table 1. Inflation expectations 3 years ahead, April 2020 – March 2021

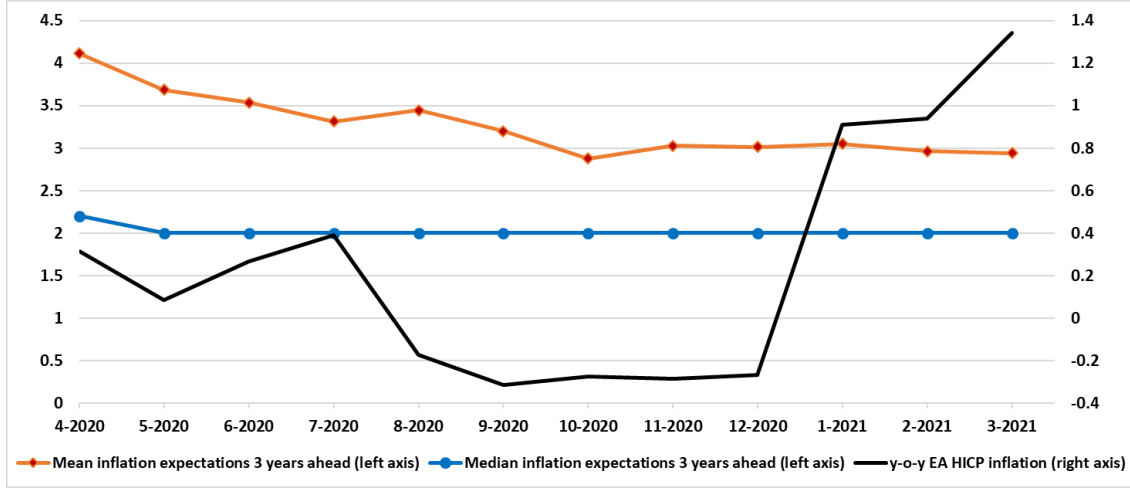
	BE	DE	ES	FR	IT	NL	Average
Mean	3.2	2.5	3.7	2.9	4.5	2.9	3.3
Median	2.0	1.8	2.0	1.2	2.5	2.0	2.0
% well-anchored	14.9	11.3	10.9	9.6	10.5	14.5	11.0

Source: ECB CES pilot survey. *Note:* Weighted results for the mean and % well-anchored, which is based on the strict definition of [1.8%, 2%]. The number of observations is 116,650. Quantitative inflation expectations are winsorized at 5%.

Mean expected inflation 3 years ahead reduced significantly from 4.1% in April 2020 to 2.9% in March 2021, on average across six countries (see Figure 3). Meanwhile, median expected inflation remained constant at 2% in the entire sample period, except April 2020. The downward dynamics in consumers' inflation expectations is consistent with a decline in HICP inflation in the euro area, related to depressed aggregated demand and spending due to the COVID-19 crisis. Notably, inflation expectations are well above realized inflation in the euro area in the analyzed period. This observation is in line with the evidence showing that euro area consumers believe inflation to be significantly higher than it actually is (Coibion et al. 2020).

⁷ Note that even when respondents believe that the ECB will achieve its medium-term inflation goal, inflation that respondents expect in the country they live in can deviate from this goal because the ECB's objective refers to the euro-area-wide inflation rate and not to inflation in each individual member-state.

Figure 3. Inflation expectations and HICP inflation during April 2020 – March 2021



Source: mean and median inflation expectations are based on the data from ECB CES pilot survey, own calculations; year-on-year HICP inflation rate for the euro area is sourced from Eurostat.

Note: Weighted results for the mean inflation expectations, unweighted for the median inflation expectations. Inflation expectations are winsorized at 5%. The number of observations is 116,650.

4. Empirical analysis: determinants of trust in the ECB

4.1. Methodology

As a first step in our empirical analysis we use the CES pilot microdata for 6 euro area countries over 12 survey waves to estimate the determinants of trust in the ECB by applying the random-effects panel regression technique. The baseline model is specified as follows:

$$trust\ in\ the\ ECB_{ict} = \alpha + \beta * X_{ict} + \gamma_t + \theta_c + \mu_i + \varepsilon_{ict}, \quad (1)$$

where $trust\ in\ the\ ECB_{ict}$ denotes the value for trust in the ECB for respondent i from country c in month t . X_{ict} is a vector of explanatory variables, as constructed in Section 3.2, that are considered as potential drivers of trust in the ECB. The baseline regressors include variables that capture past COVID-19 experiences, financial knowledge, and respondents' personal characteristics, which are complemented with additional controls in the extensions. α is a constant, β is a vector of estimated parameters on the explanatory variables; γ_t denotes time-fixed effects and θ_c - country-fixed effects. μ_i are unobserved time-invariant respondent-specific random effects.⁸ ε_{ict} is an idiosyncratic error term with mean 0 and variance $\sigma_{\varepsilon_{ict}}^2$.

⁸ Note that we use unobserved individual-specific random effects, as we control for time-invariant respondents' personal characteristics (age, gender, income etc.) with observed variables. The implication is that these personal characteristics will drop out from the estimation if we include individual-specific fixed effects instead of random ones. A possible way around it, suggested in the literature, involves using correlated random effects (Wooldridge, 2019). It includes random effects in the model but still controls for unobserved heterogeneity correlated with observed variables. This is known as the Mundlak procedure: for variables which vary over time and individuals,

Standard errors are clustered at the individual respondent level to account for heteroscedasticity and autocorrelation in the error term.

4.2. Main results

We find that COVID-19 experiences have a significant impact on consumers' trust in the ECB (baseline results: Table 2, column 1). Respondents who reduced the number of hours worked in the previous month trust the ECB 0.08 point less than respondents whose working hours did no change. In contrast, an increase in past hours worked due to COVID-19 did not affect the respondents' trust in the ECB. The results also hold for less hours worked in the future (Table 2, column 3): respondents who expect their working hours in the next 3 months to decrease due to COVID-19 trust the ECB 0.11 point less, while those who expect an increase in hours worked trust the ECB 0.06 point more than respondents whose future working hours are not expected to change. This result suggests that adverse COVID-19 experiences result in a loss of trust in the ECB, probably because it is being indirectly blamed for deteriorating economic conditions.⁹

We find that trust in the ECB increases with financial knowledge. Compared to respondents who think they are not knowledgeable, those who view themselves as very knowledgeable report 0.2 point higher trust in the ECB (Table 2, column 1). We also find a positive effect of financial knowledge when we include actual financial knowledge instead of self-assessed financial knowledge (Table 2, column 2). People with all four knowledge questions correct have 0.1 point higher trust in the ECB than people who incorrectly answered all these questions, indicated to not know the answer or skipped the questions.

In line with the descriptive statistics, we find evidence that Italians have the lowest degree of trust in the ECB and French and Germans the highest. Trust of Italians is 0.7 point lower than trust of Germans (the reference group). Next are Spaniards and Belgians with 0.4 and 0.5 point lower trust, respectively. Dutch respondents exhibit 0.2 point lower trust in the ECB relative to Germans, while French have similar trust as Germans.

There is heterogeneity in consumers' trust in the ECB, related to personal characteristics. Trust is 0.2 point higher among males than females. It is also related to age and varies over a

time averages per individual are created and added in the random effects regression. This approach, however, is not suitable in our case because most of our covariates are constructed as dummy variables. Time averages of these variables (\bar{x}_i) will be equal to the variables themselves (x_{it}). By construction x_{it} is collinear to large extent with \bar{x}_i and as the number of periods drops, this collinearity increases. Including in our model both \bar{x}_i and x_{it} results in \bar{x}_i dropping out ("omitted because of collinearity"), while correlation between the two is equal 1.

⁹ The regression results with trust in the EP and trust in the EC as dependent variables suggest that adverse COVID-19 experiences are also associated with a loss of trust in the EP and the EC (results available on request).

life cycle. People aged 55-70 have 0.2 point lower trust than those younger than 35 (reference group), while people aged 35-54 trust the ECB the least. Trust increases with education: respondents with a high education level have 0.2 point higher trust in the ECB than people with a low education level. Insofar as educated people are relatively more knowledgeable, this finding may suggest that mistrust is somewhat based on ignorance (Hudson, 2006).

Trust in the ECB is also positively related to consumers' income. Respondents with a total combined net income below €20,000 have 0.5 point lower trust than people with an income between €20,000 and €40,000 (reference group). In contrast, highest-earning respondents (above €60,000) have 0.5 point higher trust in the ECB than people in the reference group. The employment status is not significantly related to trust, possibly because we already capture this characteristic with variables for income or change in hours worked due to the COVID-19 crisis. We include a dummy variable for homeowner without mortgage as a proxy for wealth and find that trust is 0.2 point higher for wealthy respondents than for others.

The results are not altered much when we control for the financial situation and liquidity access of respondents (Table 2, columns 4-6). People who are unconstrained in terms of liquidity have 0.2 point higher trust than liquidity-constrained ones. In addition, respondents whose past financial situation has improved or who expect their future financial situation to improve, trust the ECB 0.1 point more, while respondents whose past or future expected financial situation is evaluated as worse, trust the ECB 0.2 point less than those whose past or future situation has not changed.

The outcomes are robust to using an alternative methodology and dropping observations (see Table B.1 in Appendix B). Given that our dependent variable takes discrete values from 0 to 10, as a robustness check we estimate a random effects ordered probit. The results are qualitatively similar to the main ones (Table B.1, column 1). Next, we drop observations for respondents who have absolutely no trust in the ECB (i.e., trust = 0). The outcomes are not substantially affected by this modification (Table B.1, column 2).

4.3. Extension: additional driving factors for trust in the ECB

As an extension, we control for a number of additional factors that could potentially impact trust in the ECB. First, we include in the baseline specification (as in Table 2, column 1) several variables that capture trust in general and trust in other EU institutions, as well as government support during the COVID-19 crisis (see Table 3).

We add to the literature by also showing a positive link between trust in other people and trust in the ECB. The association between the two variables is strong: one point higher trust in other people is associated with about 0.3 point higher trust in the ECB (see Table 3, column 1). Prior research finds that higher levels of generalized trust go along with higher trust in financial institutions (van der Cruisen et al., 2020).

By including trust in the EC and the EP as explanatory variables, we test whether the COVID-19 crisis prompted consumers to reduce their overall trust in European institutions. A positive link between trust in the EC and the ECB is reported by prior studies (Ehrmann et al. 2013; Albinowski et al. 2014; Farvaque et al. 2016). Bergbauer et al. (2020) find that trust in the ECB depends positively on consumers' satisfaction with the EU's performance, especially during the financial crisis, as well as on their attachment to values of EU integration, trust in the national government, and support for the euro. Consumers who perceive lack of accountability are most likely to distrust the ECB (Kaltenthaler et al. 2010).

Our findings show that respondents who trust other EU institutions more also have higher trust in the ECB. That is, one point higher trust in the EC and the EP is significantly associated with higher trust in the ECB by 0.7 point (see Table 3, columns 2-3).

Domestic government policies aimed to minimize the impact of the COVID-19 crisis on consumers' economic situation also contribute to trust in the ECB (see Table 3, columns 4-5). The results show that people who received at least one type of government support have 0.3 point higher trust in the ECB than those who received no support at all. In addition, people who rate the adequacy of this support for their financial situation as very good (value 10) trust the ECB 1.4 point more than people who rate it as very poor (value 0).

Next, a better macroeconomic situation is associated with higher trust in the ECB. We estimate a baseline specification while controlling for general economic conditions in the individual euro area countries (see Table 4, columns 1-3). Our results show that more favorable macroeconomic situation - captured by higher lagged values of IPI and PMI - improves trust in the ECB, while lagged inflation is not significantly associated with trust, based our sample.

Finally, the worsening of the pandemic situation in a country is correlated with lower trust in the ECB (see Table 4, columns 4-6). We find that more stringent restrictions are associated with lower trust in the ECB, while higher number of new cases or higher death toll do not enter the model significantly.

Table 2. Main estimation results: drivers of trust in the ECB

	(1)	(2)	(3)	(4)	(5)	(6)
<i>COVID-19: hours worked increased</i>	-0.016 (0.020)	-0.015 (0.020)		-0.019 (0.020)	-0.016 (0.020)	-0.013 (0.020)
<i>COVID-19: hours worked decreased</i>	-0.080*** (0.015)	-0.079*** (0.015)		-0.077*** (0.015)	-0.063*** (0.015)	-0.070*** (0.015)
<i>Male</i>	0.225*** (0.035)	0.227*** (0.035)	0.224*** (0.035)	0.217*** (0.035)	0.215*** (0.035)	0.219*** (0.035)
<i>Age 35-54</i>	-0.348*** (0.042)	-0.352*** (0.042)	-0.345*** (0.042)	-0.341*** (0.042)	-0.332*** (0.042)	-0.323*** (0.042)
<i>Age 55-70</i>	-0.211*** (0.048)	-0.218*** (0.048)	-0.205*** (0.048)	-0.218*** (0.048)	-0.192*** (0.048)	-0.172*** (0.048)
<i>Age 71 and over</i>	0.056 (0.089)	0.045 (0.089)	0.066 (0.089)	0.036 (0.089)	0.067 (0.089)	0.099 (0.089)
<i>Education</i>	0.123*** (0.024)	0.124*** (0.024)	0.122*** (0.024)	0.112*** (0.024)	0.123*** (0.024)	0.124*** (0.023)
<i>Income: below €20,000</i>	-0.507*** (0.047)	-0.509*** (0.047)	-0.507*** (0.047)	-0.469*** (0.047)	-0.483*** (0.046)	-0.495*** (0.046)
<i>Income: €40,000-59,999</i>	0.305*** (0.048)	0.307*** (0.048)	0.306*** (0.048)	0.282*** (0.048)	0.293*** (0.048)	0.291*** (0.048)
<i>Income: above €60,000</i>	0.475*** (0.061)	0.482*** (0.061)	0.475*** (0.061)	0.448*** (0.061)	0.457*** (0.061)	0.459*** (0.061)
<i>Income unknown</i>	-0.276*** (0.058)	-0.279*** (0.058)	-0.276*** (0.058)	-0.267*** (0.058)	-0.267*** (0.058)	-0.273*** (0.058)
<i>Homeowner without mortgage</i>	0.163*** (0.040)	0.165*** (0.040)	0.166*** (0.040)	0.136*** (0.040)	0.155*** (0.040)	0.164*** (0.039)
<i>Employed</i>	-0.030 (0.038)	-0.030 (0.038)	-0.036 (0.038)	-0.042 (0.038)	-0.042 (0.038)	-0.034 (0.038)
<i>Self-assessed financial knowledge</i>	0.065*** (0.023)		0.066*** (0.023)	0.056** (0.023)	0.067*** (0.023)	0.066*** (0.023)
<i>Actual financial knowledge</i>		0.028* (0.016)				
<i>COVID-19: hours worked will increase</i>			0.056*** (0.017)			
<i>COVID-19: hours worked will decreased</i>			-0.112*** (0.017)			
<i>Liquidity unconstrained</i>				0.217*** (0.019)		
<i>Past financial situation: better</i>					0.111*** (0.019)	
<i>Past financial situation: worse</i>					-0.186*** (0.015)	
<i>Future financial situation: better</i>						0.115*** (0.017)
<i>Future financial situation: worse</i>						-0.201*** (0.015)
<i>BE</i>	-0.462*** (0.064)	-0.449*** (0.064)	-0.461*** (0.064)	-0.445*** (0.064)	-0.428*** (0.064)	-0.432*** (0.064)
<i>ES</i>	-0.384*** (0.054)	-0.369*** (0.054)	-0.388*** (0.054)	-0.371*** (0.054)	-0.348*** (0.054)	-0.374*** (0.054)
<i>FR</i>	0.021 (0.049)	0.029 (0.049)	0.018 (0.049)	0.040 (0.049)	0.034 (0.049)	0.043 (0.049)
<i>IT</i>	-0.686*** (0.059)	-0.697*** (0.059)	-0.689*** (0.059)	-0.669*** (0.058)	-0.639*** (0.059)	-0.661*** (0.058)
<i>NL</i>	-0.206*** (0.065)	-0.174*** (0.064)	-0.200*** (0.065)	-0.206*** (0.065)	-0.193*** (0.065)	-0.182*** (0.065)
Number of observations	118,221	118,232	118,221	118,221	118,221	118,221
Number of respondents	18,265	18,266	18,265	18,265	18,265	18,265
Wald χ^2	1,311.2***	1,311.3***	1,357.8***	1,463.6***	1,542.6***	1,612.1***

Notes: The table shows the results of random effects panel regressions, with standard errors clustered at the individual level (in parentheses). The dependent variable is trust in the ECB. Constant and wave dummies are included (not shown). ***, **, * denote significance at 1%, 5%, and 10% level, respectively.

Table 3. Extension: controlling for trust in institutions and government support

	(1)	(2)	(3)	(4)	(5)
<i>COVID-19: hours worked increased</i>	-0.018 (0.020)	-0.101*** (0.017)	-0.093*** (0.017)	0.011 (0.054)	-0.013 (0.025)
<i>COVID-19: hours worked decreased</i>	-0.083*** (0.015)	-0.049*** (0.011)	-0.052*** (0.012)	-0.178*** (0.039)	-0.066*** (0.020)
<i>Male</i>	0.158*** (0.034)	0.162*** (0.017)	0.160*** (0.018)	0.170*** (0.045)	0.209*** (0.037)
<i>Age 35-54</i>	-0.286*** (0.041)	-0.017 (0.020)	-0.019 (0.022)	-0.296*** (0.056)	-0.228*** (0.045)
<i>Age 55-70</i>	-0.169*** (0.046)	0.107*** (0.023)	0.101*** (0.025)	-0.138** (0.065)	-0.038 (0.052)
<i>Age 71 and over</i>	0.084 (0.088)	0.203*** (0.044)	0.229*** (0.047)	0.277** (0.111)	0.156* (0.093)
<i>Education</i>	0.095*** (0.023)	0.032*** (0.011)	0.024** (0.012)	0.133*** (0.032)	0.133*** (0.025)
<i>Income: below €20,000</i>	-0.396*** (0.045)	-0.159*** (0.022)	-0.184*** (0.023)	-0.435*** (0.061)	-0.455*** (0.050)
<i>Income: €40,000-59,999</i>	0.260*** (0.046)	0.143*** (0.023)	0.145*** (0.025)	0.290*** (0.062)	0.296*** (0.051)
<i>Income: above €60,000</i>	0.395*** (0.059)	0.273*** (0.031)	0.298*** (0.034)	0.450*** (0.079)	0.435*** (0.065)
<i>Income unknown</i>	-0.171*** (0.056)	-0.043 (0.027)	-0.055* (0.030)	-0.161** (0.077)	-0.249*** (0.063)
<i>Homeowner without mortgage</i>	0.115*** (0.038)	0.029 (0.019)	0.044** (0.020)	0.230*** (0.050)	0.135*** (0.042)
<i>Employed</i>	-0.070* (0.037)	0.007 (0.018)	0.018 (0.020)	0.058 (0.053)	-0.044 (0.041)
<i>Self-assessed financial knowledge</i>	0.050** (0.022)	0.110*** (0.011)	0.109*** (0.012)	0.047 (0.029)	0.060** (0.024)
<i>Trust in other people</i>	0.263*** (0.007)				
<i>Trust in the European Commission</i>		0.707*** (0.004)			
<i>Trust in the European Parliament</i>			0.681*** (0.004)		
<i>COVID-19: government support received</i>				0.302*** (0.040)	
<i>COVID-19: government support adequate</i>					0.136*** (0.004)
<i>BE</i>	-0.268*** (0.062)	0.254*** (0.032)	0.354*** (0.035)	-0.350*** (0.086)	-0.336*** (0.071)
<i>ES</i>	-0.376*** (0.052)	0.136*** (0.027)	0.208*** (0.029)	-0.307*** (0.069)	-0.070 (0.057)
<i>FR</i>	0.067 (0.047)	0.352*** (0.025)	0.407*** (0.027)	0.041 (0.065)	0.251*** (0.051)
<i>IT</i>	-0.500*** (0.057)	0.142*** (0.028)	0.219*** (0.030)	-0.652*** (0.073)	-0.296*** (0.062)
<i>NL</i>	-0.200*** (0.062)	0.245*** (0.032)	0.330*** (0.034)	-0.180** (0.088)	-0.132* (0.073)
Number of observations	118,221	117,482	117,719	19,821	70,474
Number of respondents	18,265	18,189	18,220	12,211	15,153
Wald χ^2	2,800.3***	47,745.3***	42,278.0***	609.2***	2,331.9***

Notes: The table shows the results of random effects panel regressions, with standard errors clustered at the individual level (in parentheses). The dependent variable is trust in the ECB. Constant and wave dummies are included (not shown). ***, **, * denote significance at 1%, 5%, and 10% level, respectively.

Table 4. Extension: controlling for macroeconomic and pandemic-related conditions

	(1)	(2)	(3)	(4)	(5)	(6)
<i>COVID-19: hours worked increased</i>	-0.016 (0.020)	-0.014 (0.020)	-0.020 (0.021)	-0.016 (0.020)	-0.016 (0.020)	-0.016 (0.020)
<i>COVID-19: hours worked decreased</i>	-0.080*** (0.015)	-0.071*** (0.015)	-0.088*** (0.016)	-0.079*** (0.015)	-0.080*** (0.015)	-0.080*** (0.015)
<i>Male</i>	0.225*** (0.035)	0.225*** (0.035)	0.233*** (0.037)	0.225*** (0.035)	0.225*** (0.035)	0.225*** (0.035)
<i>Age 35-54</i>	-0.348*** (0.042)	-0.346*** (0.042)	-0.320*** (0.045)	-0.348*** (0.042)	-0.348*** (0.042)	-0.348*** (0.042)
<i>Age 55-70</i>	-0.210*** (0.048)	-0.208*** (0.048)	-0.180*** (0.051)	-0.210*** (0.048)	-0.211*** (0.048)	-0.211*** (0.048)
<i>Age 71 and over</i>	0.056 (0.089)	0.058 (0.090)	0.018 (0.092)	0.057 (0.089)	0.056 (0.089)	0.056 (0.089)
<i>Education</i>	0.123*** (0.024)	0.125*** (0.024)	0.117*** (0.025)	0.124*** (0.024)	0.123*** (0.024)	0.123*** (0.024)
<i>Income: below €20,000</i>	-0.507*** (0.047)	-0.508*** (0.047)	-0.548*** (0.049)	-0.507*** (0.047)	-0.507*** (0.047)	-0.507*** (0.047)
<i>Income: €40,000-59,999</i>	0.305*** (0.048)	0.306*** (0.048)	0.312*** (0.051)	0.305*** (0.048)	0.305*** (0.048)	0.305*** (0.048)
<i>Income: above €60,000</i>	0.475*** (0.061)	0.475*** (0.061)	0.441*** (0.065)	0.476*** (0.061)	0.475*** (0.061)	0.475*** (0.061)
<i>Income unknown</i>	-0.276*** (0.058)	-0.276*** (0.058)	-0.291*** (0.062)	-0.276*** (0.058)	-0.276*** (0.058)	-0.276*** (0.058)
<i>Homeowner without mortgage</i>	0.163*** (0.040)	0.162*** (0.040)	0.161*** (0.042)	0.163*** (0.040)	0.163*** (0.040)	0.163*** (0.040)
<i>Employed</i>	-0.030 (0.038)	-0.033 (0.038)	-0.020 (0.041)	-0.031 (0.038)	-0.031 (0.038)	-0.030 (0.038)
<i>Self-assessed financial knowledge</i>	0.065*** (0.023)	0.065*** (0.023)	0.028 (0.024)	0.065*** (0.023)	0.065*** (0.023)	0.065*** (0.023)
<i>HICP inflation_{t-1}</i>	0.018 (0.012)					
<i>Industrial production_{t-1}</i>		0.014*** (0.001)				
<i>PMI_{t-1}</i>			0.004*** (0.002)			
<i>Stringency index_{t-1}</i>				-0.003*** (0.001)		
<i>New COVID-19 cases_{t-1}</i>					-0.000 (0.000)	
<i>New COVID-19 deaths_{t-1}</i>						0.008 (0.023)
<i>BE</i>	-0.460*** (0.064)	-0.654*** (0.066)		-0.475*** (0.064)	-0.461*** (0.064)	-0.465*** (0.065)
<i>ES</i>	-0.368*** (0.055)	-0.400*** (0.054)	-0.363*** (0.054)	-0.378*** (0.054)	-0.382*** (0.054)	-0.385*** (0.054)
<i>FR</i>	0.021 (0.049)	0.059 (0.049)	0.036 (0.049)	0.017 (0.049)	0.022 (0.049)	0.020 (0.049)
<i>IT</i>	-0.678*** (0.059)	-0.700*** (0.059)	-0.679*** (0.059)	-0.671*** (0.059)	-0.685*** (0.059)	-0.688*** (0.059)
<i>NL</i>	-0.220*** (0.066)	-0.393*** (0.068)	-0.183*** (0.066)	-0.216*** (0.065)	-0.205*** (0.065)	-0.206*** (0.065)
Number of observations	118,221	118,221	106,523	118,221	118,221	118,221
Number of respondents	18,265	18,265	16,203	18,265	18,265	18,265
Wald χ^2	1,317.4***	1,465.5***	1,258.0***	1,324.7***	1,311.5***	1,312.4***

Notes: The table shows the results of random effects panel regressions, with standard errors clustered at the individual level (in parentheses). The dependent variable is trust in the ECB. Constant and wave dummies are included (not shown). ***, **, * denote significance at 1%, 5%, and 10% level, respectively.

5. Empirical analysis: impact of trust in the ECB on inflation expectations

5.1. Methodology

As a second step in our empirical analysis we estimate the impact of trust in the ECB on inflation expectations, by applying random-effects regression techniques. The model is specified as follows:

$$\text{inflation anchored}_{ict}^e = f(\text{trust in the ECB}_{ict}, X_{ict}) + \gamma_t + \theta_c + \mu_i + \varepsilon_{ict}, \quad (2)$$

where $\text{inflation anchored}_{ict}^e$ denotes whether inflation expectations of respondent i from country c in month t are well-anchored. First, we estimate a random effects probit model for *well-anchored inflation expectations 3 years ahead* as a dependent variable using the strict (range [1.8%; 2%]) and the loose (range [1.5%; 2%]) definitions of the constructed variables. Recall that these variables are 1 in case inflation expectations are well-anchored and 0 if they are not well-anchored. Next, we run random effects panel regressions with *inflation expectations gap 3 years ahead* as a dependent variable. As an additional analysis, we estimate model specifications with dependent variables capturing the anchoring of short-term inflation expectations. Trust in the ECB for respondent i from country c in month t ($\text{trust in the ECB}_{ict}$) is our main explanatory variable. X_{ict} is a vector of other explanatory variables, which include respondents' personal characteristics and financial knowledge (either self-assessed or actual). As before, γ_t denotes time-fixed effects and θ_c - country-fixed effects. μ_i are unobserved time-invariant respondent-specific random effects and ε_{ict} is an idiosyncratic error term with mean 0 and variance $\sigma_{\varepsilon_{ict}}^2$. Standard errors are clustered at the individual respondent level.

5.2. Results

Higher trust in the ECB goes along with better anchored inflation expectations 3 years ahead. Table 5 shows the estimation results and calculated marginal effects of our key variables of interest – trust in the ECB and financial knowledge. The evidence for this result is weak when we consider inflation expectations between 1.8% and 2% to be well-anchored (columns 1-2), but convincing when we use a loose definition with the [1.5%, 2%] range for well-anchored expectations (columns 3-4) or the inflation expectations gap (columns 5-6). For example, the marginal effect of trust in the ECB on the likelihood that someone has inflation expectations at the 3-year horizon between 1.5% and 2% is 0.14 percentage point (p.p.) in case of the specification with self-assessed financial knowledge included as a regressor (column 3). In other words, a person with complete trust in the ECB (trust = 10) is 1.4 p.p. more likely to have well-anchored inflation expectations than a person with absolutely no trust in the ECB (trust =

0). This effect is 1.2 p.p. in the model with actual financial knowledge (column 4). The regressions with the gap variable show that the deviation of inflation expectations from the ECB's inflation goal (1.9%) is 0.8 p.p. lower for people with complete trust in the ECB than for those who completely distrust the ECB. Trust in the ECB has no significant effect on the anchoring of inflation expectations 12 months ahead (see Table C.1 in Appendix C). This may be unsurprising given that the ECB's price stability goal refers to inflation in medium term, while short-run inflation is affected by factors beyond the central banks' control.

Compared to trust in the ECB, financial knowledge has a much stronger positive effect on the likelihood that inflation expectations are well-anchored. For example, the likelihood that someone expects inflation 3 years ahead to range between 1.5% and 2% is 6 p.p. higher for someone who thinks he/she is very knowledgeable with respect to financial matters than for someone who is not knowledgeable (column 3). The effect of actual knowledge is even larger. People who answered all knowledge questions correct are about 17 p.p. more likely to have well-anchored inflation expectations than people with all knowledge questions incorrect and/or unanswered (column 4).

The anchoring of inflation expectations is also related to respondents' personal characteristics. Males have better anchored inflation expectations than females. The same holds for people aged 35 years or older in comparison to younger people. The likelihood that inflation expectations are well-anchored positively depends on the level of education and income. It is also higher for homeowners without a mortgage (proxy for wealth) than for other people. Employed people have better anchored inflation expectations than jobless people. Belgians and the Dutch are more likely to have well-anchored inflation expectations than Germans (the reference group), whereas the opposite holds for Italians and the French.

As a robustness check, we employ an instrumental-variable (IV) estimator to identify the impact of trust in the ECB on anchoring of inflation expectations. We do so to account for a potential endogeneity problem: consumers' inflation expectations may affect their trust in the ECB or both variables can be driven by a third unobserved factor. Finding good instruments which correlate with trust in the ECB but do not correlate with inflation expectations, is not trivial. We follow previous literature to guide us in selecting suitable instrumental variables. In particular, Christelis et al. (2020) instrument trust in the ECB with trust in other people. The test of overidentifying restrictions after the IV estimation indicates however that this instrument is not valid for our sample. Alternatively, Mellina and Schmidt (2018) propose to use as instruments trust in European institutions, which strongly correlates with trust in the ECB but

is less likely to be linked to consumers' anchoring of inflation expectations. Following this, we instrument trust in the ECB with trust in the EC and the EP, sourced from the CES data.

The IV estimation results are shown in Table B.2 in Appendix B. We estimate IV probit models for our two dummy measures of well-anchored inflation expectations 3 years ahead (columns 1-4) and IV regressions for the inflation expectations gap 3 years ahead (columns 5-6). The F-test statistic from the first-stage regressions is very high in all model specifications, indicating that the instruments are strong (the “rule of thumb” for the goodness-of-fit in the first-stage regressions is an F-test statistic above 10). In addition, both instruments are positively and significantly correlated with trust in the ECB. Moreover, a test of overidentifying restrictions fails to reject the null hypothesis of joint instrument validity. Thus, we find no evidence of consistency problems in the IV estimates and can conclude that the selected instruments are valid. Finally, an endogeneity test has a p-value of 0.00 for most specifications, which suggests that we can reject the null hypothesis of exogeneity of trust in the ECB, and thus the IV estimation is justified.

We find that the trust effect from the IV estimation is larger in absolute value and significant in specifications with a loose definition of well-anchored inflation expectations and with an inflation expectations gap. According to the calculated marginal effect (columns 3-4), a person with complete trust in the ECB is about 5 p.p. more likely to have well-anchored inflation expectations 3 years ahead compared to a person with absolutely no trust in the ECB. In addition, the inflation expectations gap is 1.7 p.p. lower for people with complete trust in the ECB than for those with no trust (columns 5-6).¹⁰ The effect of financial knowledge on anchoring of inflation expectations is also larger in absolute value in the IV models. The results for remaining explanatory variables are comparable to the ones reported in Table 5.

¹⁰ According to Christelis et al. (2020), a larger absolute value of the IV estimate compared with the OLS as in columns (5-6) could be due to the presence of unobserved variables that affect both trust in the ECB and inflation expectations, leading to an algebraically larger (less negative, but smaller in absolute value) OLS estimate. “Alternatively, the difference between OLS and IV estimates could be due to the fact that in the presence of a heterogeneous effect of trust in the ECB this estimate represents a local average treatment effect, that is, the effect of trust in the ECB on inflation for those who change their trust in the ECB due to changes in the instrument values. On the other hand, the OLS estimate represents the overall average treatment effect” (Christelis et al. 2020: 20).

Table 5. Estimation results: impact of trust in the ECB on anchoring of inflation expectations 3 years ahead

	Well-anchored, strict: [1.8%; 2.0%]		Well-anchored, loose: [1.5%; 2.0%]		Inflation expectations gap	
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Trust in the ECB</i>	0.005* (0.003)	0.004 (0.003)	0.008*** (0.003)	0.007** (0.003)	-0.078*** (0.006)	-0.078*** (0.006)
<i>Male</i>	0.158*** (0.019)	0.103*** (0.019)	0.204*** (0.019)	0.139*** (0.019)	-0.586*** (0.041)	-0.471*** (0.041)
<i>Age 35-54</i>	0.160*** (0.025)	0.133*** (0.024)	0.195*** (0.025)	0.161*** (0.025)	0.083 (0.051)	0.138*** (0.051)
<i>Age 55-70</i>	0.256*** (0.027)	0.198*** (0.027)	0.330*** (0.028)	0.256*** (0.027)	0.031 (0.058)	0.157*** (0.058)
<i>Age 71 and over</i>	0.183*** (0.050)	0.130*** (0.050)	0.285*** (0.051)	0.215*** (0.050)	-0.071 (0.109)	0.060 (0.107)
<i>Education</i>	0.126*** (0.014)	0.084*** (0.014)	0.148*** (0.014)	0.096*** (0.014)	-0.239*** (0.030)	-0.134*** (0.030)
<i>Income: below €20,000</i>	-0.103*** (0.026)	-0.099*** (0.026)	-0.115*** (0.026)	-0.109*** (0.026)	0.705*** (0.060)	0.688*** (0.059)
<i>Income: €40,000-59,999</i>	0.077*** (0.027)	0.049* (0.027)	0.086*** (0.028)	0.053* (0.027)	-0.196*** (0.053)	-0.137*** (0.052)
<i>Income: above €60,000</i>	0.193*** (0.033)	0.127*** (0.033)	0.285*** (0.034)	0.206*** (0.033)	-0.385*** (0.063)	-0.211*** (0.062)
<i>Income unknown</i>	-0.062* (0.032)	-0.060* (0.032)	-0.059* (0.032)	-0.058* (0.032)	0.257*** (0.072)	0.241*** (0.071)
<i>Homeowner without mortgage</i>	0.055*** (0.021)	0.041* (0.021)	0.059*** (0.022)	0.043** (0.022)	-0.294*** (0.047)	-0.266*** (0.047)
<i>Employed</i>	0.072*** (0.021)	0.052** (0.021)	0.063*** (0.022)	0.039* (0.022)	-0.292*** (0.048)	-0.239*** (0.047)
<i>Self-assessed financial knowledge</i>	0.066*** (0.012)		0.114*** (0.012)		-0.066** (0.027)	
<i>Actual financial knowledge</i>		0.184*** (0.009)		0.241*** (0.009)		-0.378*** (0.019)
<i>BE</i>	0.184*** (0.036)	0.191*** (0.035)	0.180*** (0.036)	0.195*** (0.035)	0.435*** (0.073)	0.468*** (0.071)
<i>ES</i>	0.016 (0.030)	0.058** (0.029)	-0.061** (0.031)	-0.002 (0.030)	1.015*** (0.064)	0.965*** (0.063)
<i>FR</i>	-0.183*** (0.030)	-0.128*** (0.029)	-0.227*** (0.031)	-0.153*** (0.030)	0.574*** (0.054)	0.478*** (0.053)
<i>IT</i>	-0.086*** (0.031)	-0.104*** (0.030)	-0.202*** (0.032)	-0.228*** (0.031)	1.729*** (0.069)	1.783*** (0.069)
<i>NL</i>	0.194*** (0.036)	0.174*** (0.035)	0.261*** (0.036)	0.254*** (0.035)	-0.330*** (0.067)	-0.214*** (0.064)
Marginal effect: Trust in the ECB	0.078* (0.046)	0.062 (0.046)	0.138*** (0.053)	0.120*** (0.053)		
Marginal effect: Financial knowledge	0.966*** (0.175)	2.696*** (0.136)	1.959*** (0.213)	4.163*** (0.161)		
Number of observations	113,170	113,180	113,170	113,180	113,170	113,180
Number of respondents	18,160	18,161	18,160	18,161	18,160	18,161
Wald χ^2	787.8***	1,104.7***	1,333.5***	1,819.4***	2,976.8***	3,327.7***

Notes: The table shows the estimation results of random effects probit in columns (1)-(4) and random effects panel regressions in columns (5)-(6): coefficients, with clustered standard errors (in parentheses). The dependent variables in columns (1)-(4) are *well-anchored inflation expectations 3 years: strict* and *well-anchored inflation expectations 3 years: loose*, respectively, which are 1 for respondents with well-anchored inflation expectations and 0 for others. The dependent variable in columns (5)-(6) is *inflation expectations gap 3 years*. Constant and wave dummies are included (not shown). ***, **, * denote significance at 1%, 5%, and 10% level, respectively.

6. Inflation expectations and households' spending decisions

6.1. Methodology

As a last step in our analysis, we test the importance of inflation expectations for spending decisions. We apply the random-effects regression techniques to estimate the following model:

$$spending_{ict}^e = f(inflation_{ict}^e, X_{ict}) + \gamma_t + \theta_c + \mu_i + \varepsilon_{ict}, \quad (3)$$

where $spending_{ict}^e$ denotes expected household spending of respondent i from country c in month t . We run two sets of regressions - one with *intention to buy a large item* and the other with *expected household spending* as a dependent variable. Recall that the first variable is a dummy capturing plans to buy a large item in the upcoming 12 months. It is 1 in case the respondent has such plans and 0 else. We estimate the random effects probit model to explain this intention. The second dependent variable *expected household spending* is an ordered variable reflecting how household expenditures in the next 12 months compares to spending in the past 12 months (ranging from 1 “will decrease a lot” to 5 “will increase a lot”). Therefore, random effects ordered probit is suitable in this case.

We estimate two different regressions with each of the two dependent variables. These regressions differ with respect to the variable $inflation_{ict}^e$. Expected inflation of respondent i from country c in month t is captured by *inflation expectations 3 years, quantitative* or by *inflation expectations 3 years, qualitative*. As an additional analysis we run the same set of regressions using inflation expectations 12 months ahead. X_{ict} is a vector of controls, considered as potential drivers of household spending. They include variables that capture financial knowledge, respondents' personal characteristics and liquidity conditions. γ_t denotes time-fixed effects and θ_c - country-fixed effects. μ_i are unobserved time-invariant respondent-specific random effects. ε_{ict} is an idiosyncratic error term with mean 0 and variance $\sigma_{\varepsilon,ict}^2$. Standard errors are clustered at the individual respondent level.

6.2. Results

The higher an individual's inflation expectations are, the more likely it is that he/she intends to buy a large item – such as a house, car, furniture or luxury items – in the next 12 months (Table 6). For example, based on the calculated marginal effects, for every 1 p.p. higher expected inflation 3 years ahead the likelihood of buying a large item increases by 0.3 p.p. (column 1). The results with qualitative inflation expectations give a similar picture. People who expect that prices in their country will increase a lot in the next 3 years are 2.2 p.p. more likely to intend to

buy a large item than people who expect that prices will be exactly the same as right now (column 2). When we include inflation expectations 12 months ahead, we also find a positive effect of inflation expectations on the likelihood of buying a large item (see Table C.2 in Appendix C). The magnitude of the effect is smaller than for expectations 3 years ahead.

The likelihood of buying a large item also depends on personal characteristics. It is higher for males, employed, higher educated people and those who are liquidity unconstrained. In addition, the probability to buy a large item is positively related to income and financial knowledge, while the likelihood is relatively low for homeowners without a mortgage and negatively related to age.

Expected household spending in the next 12 months in comparison to current household spending is also found to be positively associated with expected inflation (Table 6, columns 3-4). Regarding quantitative inflation expectations, the likelihood that future spending will rise a lot increases by 0.3 p.p. for every 1 p.p. higher expected inflation 3 years ahead (column 3). In addition, people who expect that prices in their country will increase a lot in the next 3 years are 3.1 p.p. more likely to answer that their expected household spending will increase a lot, compared with people who expect that prices will be exactly the same as right now (column 4). We also find a positive and significant relationship between expected household spending and expected inflation 12 months ahead (see Table C.2 in Appendix C).

Expected household spending also varies with respondents' personal characteristics. In the model specification with quantitative inflation expectations 3 years ahead (column 3), we find that the change in expected spending depends positively on age, financial knowledge, and being liquidity unconstrained, and is higher for males than for females. The change in expected spending is relatively low for the employed and for homeowners without a mortgage. There is no significant relationship with the education level. The change in expected spending is higher for people with net income above €60,000 than for people with income between €20,000 and €39,999 (reference group). The results with qualitative 3 years ahead inflation expectations give a very similar picture.

Table 6. Inflation expectations 3 years ahead and spending intentions

	<i>Intention to buy a large item</i>		<i>Expected household spending</i>	
	(1)	(2)	(3)	(4)
<i>Inflation expectations 3 years, quantitative</i>	0.013*** (0.001)		0.024*** (0.001)	
<i>Inflation expectations 3 years, qualitative</i>		0.046*** (0.007)		0.134*** (0.006)
<i>Male</i>	0.098*** (0.021)	0.092*** (0.021)	0.027* (0.015)	0.017 (0.015)
<i>Age 35-54</i>	-0.291*** (0.026)	-0.292*** (0.026)	0.098*** (0.018)	0.087*** (0.018)
<i>Age 55-70</i>	-0.386*** (0.030)	-0.388*** (0.030)	0.172*** (0.021)	0.153*** (0.020)
<i>Age 71 and over</i>	-0.531*** (0.056)	-0.533*** (0.056)	0.196*** (0.036)	0.176*** (0.036)
<i>Education</i>	0.097*** (0.015)	0.094*** (0.015)	-0.012 (0.010)	-0.018* (0.010)
<i>Income: below €20,000</i>	-0.114*** (0.028)	-0.107*** (0.028)	0.028 (0.020)	0.036* (0.020)
<i>Income: €40,000-59,999</i>	0.156*** (0.030)	0.154*** (0.030)	0.038* (0.020)	0.034* (0.020)
<i>Income: above €60,000</i>	0.507*** (0.039)	0.503*** (0.039)	0.077*** (0.026)	0.065** (0.026)
<i>Income unknown</i>	-0.263*** (0.034)	-0.262*** (0.034)	0.038 (0.024)	0.037 (0.024)
<i>Homeowner without mortgage</i>	-0.063*** (0.024)	-0.065*** (0.024)	-0.069*** (0.016)	-0.072*** (0.016)
<i>Employed</i>	0.134*** (0.023)	0.131*** (0.023)	-0.063*** (0.016)	-0.066*** (0.016)
<i>Self-assessed financial knowledge</i>	0.163*** (0.013)	0.162*** (0.013)	0.034*** (0.010)	0.028*** (0.010)
<i>Liquidity unconstrained</i>	0.659*** (0.018)	0.656*** (0.018)	0.129*** (0.013)	0.125*** (0.013)
Number of observations	106,264	106,264	116,640	116,640
Number of respondents	18,271	18,271	18,383	18,383
Wald χ^2	3,115.8***	3,102.3***	1,175.5***	1,252.4***
Model	Random effects probit		Random effects ordered probit	

Notes: The table shows the estimation results of random effects probit (columns 1-2) and random effects ordered probit (columns 3-4): coefficients, with clustered standard errors (in parentheses). The dependent variable in columns 1-2 is *intention to buy a large item*, which is 1 if for respondents who want to buy a major item in the next 12 months and 0 for other respondents. The dependent variable in columns 3-4 is *expected household spending*, which ranges from 1 ‘decrease a lot’ to 5 ‘increase a lot’. Constant, country-specific, and wave dummies are included (not shown). ***, **, * denote significance at 1%, 5%, and 10% level, respectively.

7. Conclusions

Using rich novel monthly data we shed light on trust in the ECB during the pandemic. Thereby, we contribute in several ways to the literature. First, we show that there is ample of room to improve trust in the ECB as it is on average 5.5 on a scale from 0 (no trust at all) to 10 (complete trust). Trust in the ECB varies across the six countries in our dataset and is lowest in Italy and Spain and highest in Germany. Second, our study provides further support that trust in the ECB depends on sociodemographic and macroeconomic factors, financial knowledge and trust in other institutions. Trust in the ECB is highest among males and people with a good financial situation and no liquidity constraints. It increases with education level, income, wealth, trust in

other people, and financial knowledge (both self-assessed and actual). People who trust other EU institutions more, have also higher trust in the ECB. Third, we add to the literature by showing that personal COVID-19 experiences and domestic policies to alleviate the impact of COVID-19 have affected trust in the ECB. Personal adverse COVID-19 experiences are detrimental for trust in the ECB: people who reduced the number of hours worked due to COVID-19 have lower trust in the ECB than people whose working hours did not change. Domestic government policies aimed to minimize the impact of the COVID-19 crisis on consumers' economic situation as well as better macroeconomic conditions in individual countries also contribute to trust in the ECB. Fourth, we show that trust in the ECB and financial knowledge facilitate better anchoring of consumers' inflation expectations 3 years ahead around the ECB's medium-term inflation goal. Last, we find that inflation expectations matter for consumers' expected spending decisions. The higher inflation expectations are, the higher is expected household spending and the more likely it is that someone plans to buy a large item.

Our results have some important policy implications. There are several routes to improve public's trust in the ECB, which would contribute to better anchored consumers' inflation expectations. One route may be government policies that lessen the negative effect of COVID-19 on consumers' economic situation. It is likely that households who have been hit hard by the COVID-19 pandemic would put blame for the worsening economic conditions on their governments and, indirectly, national central banks and the ECB. Providing government support could help alleviate these negative beliefs. These and other policies that improve the macroeconomic situation may also support trust in the ECB.

Another route is to enhance financial knowledge as it goes along with higher trust in the ECB. The ECB and national central banks in the euro area can underscore the importance of financial education and contribute to financial knowledge by providing educational programs and explaining monetary policy. Good examples of activities that contribute to financial knowledge include the “ECB Listens” event, held in October 2020 with intention to hear the European public's views about the impact of the ECB's monetary policy and communication and about the global challenges ahead.¹¹ Similar events were also hosted by national central banks. The ECB's strategy review has benefited from the input received from these events. The Governing Council intends to improve its communication about monetary policy decisions by enhancing the information provided and the accessibility for various audiences. The improved press release, the introductory statement (which will be renamed into the “monetary policy

¹¹ <https://www.ecb.europa.eu/home/search/review/html/ecb.strategyreview001.en.html>.

statement”), the Economic Bulletin and the monetary policy account will be complemented by a layered and more visual policy communication geared towards the public at large.¹²

In addition, trust in the ECB can be further improved by tailoring central bank communication in terms of content and targeting it at individuals with low levels of trust: females, people between 35 and 70, and people with low income, education level, and wealth.

¹² https://www.ecb.europa.eu/home/search/review/html/ecb.strategyreview_monpol_strategy_overview.en.html.

References

- Albinowski, M., P. Ciżkowicz, and A. Rzońca (2014). Links between trust in the ECB and its interest rate policy. *Applied Economics*, 46(25), 3090-3106.
- Armantier O., W. Bruine de Bruin, G. Topa, W. van der Klaauw, and B. Zafar (2015). Inflation expectations and behavior: do survey respondents act on their beliefs? *International Economic Review*, 56(2), 505-536.
- Barro, R. J. and D. B. Gordon (1983). Rules, discretion and reputation in a model of monetary policy. *Journal of Monetary Economics*, 12(1), 101-121.
- Bergbauer, S., N. Hernborg , J-F. Jamet, and E. Persson (2020). The reputation of the euro and the European Central Bank: interlinked or disconnected?, *Journal of European Public Policy*, 27(8), 1178-1194.
- Bol, D., M. Giani, A. Blais, and P.J. Loewen (2020). The effect of COVID-19 lockdowns on political support: some good news for democracy? *European Journal of Political Research*, 60(2), 497-505.
- Brouwer, N. and J. de Haan (2021). The impact of providing information about the ECB's instruments on inflation expectations and trust in the ECB: experimental evidence. DNB Working Paper No. 707, De Nederlandsche Bank.
- Bursian, D. and E. Faia (2018). Trust in the monetary authority. *Journal of Monetary Economics*, 98(C), 66-79.
- Bursian, D. and S. Fürth. (2015). Trust me! I am a European central banker. *Journal of Money, Credit and Banking*, 47(8), 1503-1530.
- Candia, B., O. Coibion, and Y. Gorodnichenko (2020). Communication and the beliefs of economic agents. NBER Working Papers 27800, National Bureau of Economic Research.
- Christelis, D., D. Georgarakos, T. Jappelli, and M. van Rooij (2020). Trust in the central bank and inflation expectations. *International Journal of Central Banking*, 16(6), 1-37.
- Coibion, O., D. Georgarakos, Y. Gorodnichenko, and M. van Rooij (2019). How does consumption respond to news about inflation? Field evidence from a randomized control trial. NBER Working Papers 26106, National Bureau of Economic Research.
- Coibion, O., Y. Gorodnichenko, S. Kumar, and M. Pedemonte (2020). Inflation expectations as a policy tool?, *Journal of International Economics*, 124(C), 103297.

D'Acunto, F., D. Hoang, and M. Weber (2016). The effect of unconventional fiscal policy on consumption expenditure. NBER Working Paper 22563, National Bureau of Economic Research.

Dias, F., C. Duarte, and A. Rua (2010). Inflation expectations in the euro area: are consumers rational? *Review of World Economics*, 146, 591-607.

Dräger, L. and U. Fritzsche (2013). Don't worry, be right! Survey wording effects on inflation perceptions and expectations. DEP (Socioeconomics) Discussion Papers, Macroeconomics and Finance Series 8, Universität Hamburg.

Duca-Radu, I., G. Kenny, and A. Reuter (2021). Inflation expectations, consumption and the lower bound: micro evidence from a large multi-country survey. *Journal of Monetary Economics*, 118, 120-134.

Ehrmann, M. and M. Fratzscher (2011). Politics and monetary policy. *The Review of Economics and Statistics*, 93(3), 941-960.

Ehrmann, M., M. Soudan, and L. Stracca (2013). Explaining European Union citizens' trust in the European Central Bank in normal and crisis times. *Scandinavian Journal of Economics*, 115(3), 781-807.

Elgie, R. (2002). The politics of the European Central Bank: principal-agent theory and the democratic deficit. *Journal of European Public Policy*, 9(2), 186-200.

Farvaque, E., M.A. Hayat, and A. Mihailov (2016). Who supports the ECB? Evidence from Eurobarometer survey data. *The World Economy*, 40(4), 654-677.

Fischer, J. and V. Hahn (2008). Determinants of trust in the European Central Bank. Working Paper Series in Economics and Finance 695, Stockholm School of Economics.

Forsells, M. and G. Kenny (2004). Survey expectations, rationality and the dynamics of Euro Area inflation. *Journal of Business Cycle Measurement and Analysis*, 1(1), 13-41.

Galati, G., R. Moessner, and M. van Rooij (2020). The anchoring of long-term inflation expectations of consumers: insights from a new survey. DNB Working Paper No. 688, De Nederlandsche Bank.

Gali, J. (2008). *Monetary policy, inflation and the business cycle: an introduction to the New Keynesian Framework*. Princeton, NJ: Princeton University Press.

Grishchenko, O., A. Mouabbi, and J.-P. Renne (2019). Measuring inflation anchoring and uncertainty: a U.S. and euro area comparison", *Journal of Money, Credit and Banking*, 51(5), 1053-1096.

- Hayo, B. and E. Neuenkirch (2014). The German public and its trust in the ECB: the role of knowledge and information search. *Journal of International Money and Finance*, 47, 286-303.
- Hudson, J. (2006). Institutional trust and subjective well-being across the EU. *Kyklos*, 59(1), 43-62.
- Jonung, F. and L. Roth (2020). Public support for the Euro and trust in the ECB. The first two decades of the common currency, in: Castañeda, J., A. Roselli and G. Wood (eds.), *The Economics of Monetary Unions. Past Experiences and the Eurozone*, pp.141-158.
- Kaltenthaler, K., C.J. Anderson, and W.J. Miller (2010). Accountability and independent central banks: Europeans and distrust of the European Central Bank, *Journal of Common Market Studies*, 48, 1261-1281.
- Knack, S. (2001). Trust, associational life and economic performance, in J. F. Helliwell (ed.), *The Contribution of Human and Social Capital to Sustained Economic Growth and Well-Being*, Human Resources Development Canada and Organization for Economic Cooperation and Development, Quebec, pp. 172-202.
- Kye, B. and S.-J. Hwang (2020). Social trust in the midst of pandemic crisis: implications from COVID-19 of South Korea. *Research in Social Stratification and Mobility*, 68, 100523.
- Lusardi, A. and O. Mitchell (2011). Financial literacy and planning: implications for retirement wellbeing, in: Mitchell, O. and A. Lusardi (eds.), *Financial Literacy: Implications for Retirement Security and the Financial Marketplace*, Oxford University Press, pp. 17-49.
- Lusardi, A., and O. Mitchell (2014). The economic importance of financial literacy: theory and evidence. *Journal of Economic Literature*, 52(1), 5-44.
- Malmendier, U. and S. Nagel. (2016). Learning from inflation experiences. *Quarterly Journal of Economics*, 131(1), 53-87.
- Mellina, S. and T. Schmidt (2018). The role of central bank knowledge and trust for the public's inflation expectations. Discussion Paper No. 32, Deutsche Bundesbank.
- Rostagno, M., C. Altavilla, G. Carboni, W. Lemke, R. Motto, A. Saint Guilhem, and J. Yiangou (2019). A tale of two decades: the ECB's monetary policy at 20. ECB Working Paper Series No. 2346, European Central Bank.
- Roth, F. (2009). The effect of the financial crisis on systemic trust. *Intereconomics*, 44, 203-208.

- Roth, F., D. Gros, and F. Nowak-Lehmann D. (2014). Crisis and citizens' trust in the European Central Bank - Panel data evidence for the euro area, 1999–2012. *Journal of European Integration*, 36(3), 303-320.
- Rumler, F. and M. T. Valderrama (2020). Inflation literacy and inflation expectations: evidence from Austrian household survey data. *Economic Modelling*, 87, 8-23.
- Schmitt-Grohé, S. and M. Uribe (2012). The making of a great contraction with a liquidity trap and a jobless recovery. NBER Working Papers 18544, National Bureau of Economic Research.
- Schnabel, I. (2020). The importance of trust for the ECB's monetary policy. Speech as part of the seminar series "Havarie Europa. Zur Pathogenese Europäischer Gegenwart" at the Hamburg Institute for Social Research, 16 December. Available online at: https://www.ecb.europa.eu/press/key/date/2020/html/ecb.sp201216_1~9caf7588cd.en.html.
- Sims, C. (2009). Inflation expectations, uncertainty and monetary policy. BIS Working Paper No. 275, Bank for International Settlements.
- van der Crujsen, C.A.B. and S.C.W. Eijffinger (2010). From actual to perceived transparency: the case of the European Central Bank. *Journal of Economic Psychology*, 31, 388-399.
- van der Crujsen, C., J. de Haan, and D-J. Jansen (2016). Trust and financial crisis experiences. *Social Indicators Research*, 127(2), 577-600.
- van der Crujsen, C., D-J. Jansen, and J. de Haan (2015). How much does the public know about the ECB's monetary policy? Evidence from a survey of Dutch households. *International Journal of Central Banking*, 11(4), 169-218.
- Walsh, C. E. (1995). Optimal contracts for central bankers. *The American Economic Review*, 85(1), 150-167.
- Wälti, S. (2012). Trust no more? The impact of the crisis on citizens' trust in central banks. *Journal of International Money and Finance*, 31(3), 593-605.
- Wooldridge, J. M. (2019). Correlated random effects models with unbalanced panels. *Journal of Econometrics*, 211(1), 137-150.
- Woodford, M. (2005). Central bank communication and policy effectiveness. *Proceedings, Federal Reserve Bank of Kansas City* (August 2005), 399-474.

Appendix A. Description of variables

Table A.1 Description of variables, used in empirical analysis of Section 4

Variable	Description	Mean	Sd	Min	Max	N
Trust in institutions						
<i>Trust in the ECB</i>	Discrete variable, from 0 (absolutely no trust) to 10 (complete trust).	5.39	2.66	0	10	118,232
<i>Trust in the European Commission</i>	Discrete variable, from 0 (absolutely no trust) to 10 (complete trust).	5.36	2.66	0	10	117,493
<i>Trust in the European Parliament</i>	Discrete variable, from 0 (absolutely no trust) to 10 (complete trust).	5.33	2.67	0	10	117,730
COVID-19 experiences						
<i>COVID-19: hours worked unchanged</i>	Dummy (1 = number of hours worked did no change in the last month, 0 = else). Reference category.	0.65	0.48	0	1	118,232
<i>COVID-19: hours worked increased</i>	Dummy (1 = number of hours worked increased in the last month, 0 = else).	0.11	0.31	0	1	118,232
<i>COVID-19: hours worked decreased</i>	Dummy (1 = number of hours worked did no change in the last month, 0 = else).	0.24	0.43	0	1	118,232
<i>COVID-19: hours worked will not change</i>	Dummy (1 = number of hours worked is not expected to change in the next three months, 0 = else). Reference category.	0.70	0.46	0	1	118,232
<i>COVID-19: hours worked will increase</i>	Dummy (1 = number of hours worked is expected to increase in the next three months, 0 = else).	0.15	0.35	0	1	118,232
<i>COVID-19: hours worked will decrease</i>	Dummy (1 = number of hours worked is expected to decrease in the next three months, 0 = else).	0.15	0.36	0	1	118,232
<i>COVID-19: government support received</i>	Dummy (0 = received no support, 1 = received support in at least one of the areas). Areas of support include: payment for lost earnings, mortgage, other loans, rent, expenses, childcare/care of dependents, emergency loan access, indirect support for employer, business, other.	0.29	0.45	0	1	19,823
<i>COVID-19: government support adequacy</i>	Discrete variable, from 0 (very poor) to 10 (very good).	4.83	2.68	0	10	70,481
Financial knowledge (see also Table A.2)						
<i>Self-assessed financial knowledge</i>	Discrete variable from 1 to 4 (1 = not knowledgeable, 2 = more or less knowledgeable, 3 = knowledgeable, 4 = very knowledgeable).	2.34	0.83	1	4	118,221
<i>Actual financial knowledge</i>	Discrete variable, from 0 (all four knowledge questions answered wrong and/or “I do not know” and/or skipped) to 4 (all questions correct).	2.44	1.13	0	4	118,232
Personal characteristics						
<i>Male</i>	Dummy (1 = male, 0 = female).	0.49	0.50	0	1	118,232
<i>Age 18-34</i>	Dummy (1 = between 18 and 34, 0 = else). Reference category.	0.23	0.42	0	1	118,232
<i>Age 35-54</i>	Dummy (1 = between 35 and 54, 0 = else).	0.46	0.50	0	1	118,232
<i>Age 55-70</i>	Dummy (1 = between 55 and 70, 0 = else).	0.27	0.44	0	1	118,232
<i>Age 71 and over</i>	Dummy (1 = 71 and over, 0 = else).	0.05	0.21	0	1	118,232

<i>Education</i>	Discrete variable (1 = primary or lower secondary education/no education, 2 = upper secondary education/post-secondary non-tertiary education, 3 = tertiary education/short-cycle non-tertiary education).	2.41	0.72	1	3	118,232
<i>Income: below €20,000</i>	Dummy (1 = total combined net of tax household income: €19,999 or less, 0 = else).	0.25	0.43	0	1	118,232
<i>Income: €20,000-40,000</i>	Dummy (1 = total combined net of tax household income: ≥ €20,000 and < €40,000, 0 = else). Reference category.	0.34	0.47	0	1	118,232
<i>Income: €40,000-60,000</i>	Dummy (1 = total combined net of tax household income: ≥ €40,000 and < €60,000, 0 = else).	0.19	0.39	0	1	118,232
<i>Income: above €60,000</i>	Dummy (1 = total combined net of tax household income: €60,000 or more, 0 = else).	0.11	0.31	0	1	118,232
<i>Income unknown</i>	Dummy (1 = income is unknown, 0 = income known).	0.12	0.32	0	1	118,232
<i>Employed</i>	Dummy (1 = working full- or part-time, 0 = temporarily laid off, on extended leave, or no job).	0.63	0.48	0	1	118,232
<i>Homeowner without mortgage</i>	Dummy (1 = homeowner without mortgage, 0 = else).	0.35	0.48	0	1	118,232
<i>Financial situation past: same</i>	Dummy (1 = same, 0 = else).	0.55	0.50	0	1	118,232
<i>Financial situation past: better</i>	Dummy (1 = better, 0 = else).	0.13	0.33	0	1	118,232
<i>Financial situation past: worse</i>	Dummy (1 = worse, 0 = else).	0.32	0.47	0	1	118,232
<i>Financial situation future: same</i>	Dummy (1 = same, 0 = else).	0.54	0.50	0	1	118,232
<i>Financial situation future: better</i>	Dummy (1 = better, 0 = else).	0.18	0.39	0	1	118,232
<i>Financial situation future: worse</i>	Dummy (1 = worse, 0 = else).	0.28	0.45	0	1	118,232
<i>Liquidity unconstrained</i>	Dummy (1 = yes, 0 = no).	0.71	0.45	0	1	118,232
<i>Trust in other people</i>	Discrete variable, from 0 (“You can’t be too careful”) to 10 (“Most people can be trusted”)	5.44	2.40	0	10	118,232
Country-specific variables						
<i>Inflation_{t-1}</i>	Y-o-y headline HICP inflation, seasonally adjusted.	0.17	0.72	-1.00	1.90	118,232
<i>Industrial Production_{t-1}</i>	Volume index of production, total industry, seasonally adjusted, 2015=100.	95.69	10.36	55.70	117.0	118,232
<i>PMI_{t-1}</i>	Manufacturing Purchasing Managers’ Index (not available for BE).	49.58	7.01	30.83	60.72	106,534
<i>Stringency index_{t-1}</i>	Government Response Stringency Index: composite measure based on 9 indicators including school closures, workplace closures, and travel bans, rescaled to a value from 0 to 100 (100 = strictest response).	65.28	12.32	39.81	92.59	118,232
<i>New cases_{t-1}</i>	New cases of COVID-19 per 100,000 people.	14.90	16.06	0.37	86.50	118,232
<i>New deaths_{t-1}</i>	New deaths due to COVID-19 per 100,000 people.	0.37	0.37	0.01	1.98	118,232

Note: The table describes the variables used in the regressions reported in Tables 2-4 (drivers of trust in the ECB). The mean, standard deviation (sd), minimum (min), maximum (max) and number of observations (N) are reported for the sample included in these regressions.

Table A.2 Description of variables, used in empirical analysis of Sections 5-6

Variable	Description	Mean	Sd	Min	Max	N
Inflation expectations						
<i>Inflation expectations 3 years, qualitative</i>	Discrete variable (1 = prices will decrease a lot, 2 = will decrease a little, 3 = will be exactly the same (0% change), 4 = will increase a little, 5 = will increase a lot).	3.75	0.86	1	5	106,640
<i>Inflation expectations 3 years, quantitative</i>	Continuous variable, winsorized at 5%.	3.31	4.48	-2	15.8	106,640
<i>Well-anchored inflation expectations 3 years: strict</i>	Dummy (1 = inflation expectations are within [1.8%, 2%], 0 = else).	0.11	0.32	0	1	113,180
<i>Well-anchored inflation expectations 3 years: loose</i>	Dummy (1 = inflation expectations are within [1.5%, 2%], 0 = else).	0.16	0.36	0	1	113,180
<i>Inflation expectations gap 3 years</i>	Continuous variable, measured as the absolute deviation of quantitative inflation expectations 3 years ahead from 1.9%.	3.06	3.54	0	13.9	113,180
<i>Inflation expectations 12 months, qualitative</i>	Discrete variable (1 = prices will decrease a lot, 2 = will decrease a little, 3 = will be exactly the same (0% change), 4 = will increase a little, 5 = will increase a lot).	3.79	0.89	1	5	121,786
<i>Inflation expectations 12 months, quantitative</i>	Continuous variable, winsorized at 5%.	3.43	4.49	-2	15.5	121,786
<i>Well-anchored inflation expectations 12 months: strict</i>	Dummy (1 = inflation expectations are within [1.8%, 2%], 0 = else).	0.11	0.31	0	1	118,207
<i>Well-anchored inflation expectations 12 months: loose</i>	Dummy (1 = inflation expectations are within [1.5%, 2%], 0 = else).	0.15	0.36	0	1	118,207
<i>Inflation expectations gap 12 months</i>	Continuous variable, measured as the absolute deviation of quantitative inflation expectations 3 years ahead from 1.9%.	3.12	3.54	0	13.6	118,207
Expected spending						
<i>Intention to buy a large item</i>	Dummy (1 = plan to purchase a large item in next 12 months, 0 = else). Large item: house/apartment, car or other vehicle, home appliance, furniture or electronic items (incl. gadgets), holiday, luxury items, incl. jewelry and watches, and another major item.	0.57	0.49	0	1	106,264
<i>Expected household spending</i>	Discrete variable (1 = will decrease a lot, 2 = will decrease a little, 3 = will remain exactly the same (0% change), 4 = will increase a little, 5 = will increase a lot).	3.32	0.96	1	5	116,640

Note: The table describes the variables used in the regressions reported in Tables 5, 6, C.1 and C.2. The mean, standard deviation (sd), minimum (min), maximum (max) and number of observations (N) are reported for the sample included in these regressions.

Table A.3 Actual financial knowledge - survey questions (✓ - correct answer)

Question formulation		Possible answers
1.	Compound interest <i>Suppose you had €100 in a savings account and the interest rate was 2% per year. After 5 years, how much do you think you would have in account if you left the money to grow?</i>	1 = more than €102, ✓ 2 = exactly €102, 3 = less than €102, 4 = don't know
2.	Real interest rate <i>Imagine that the interest rate on your savings account was 1% per year and inflation was 2% per year. After 1 year, how much would you be able to buy with the money in this account?</i>	1 = more than today, 2 = exactly the same, 3 = less than today, ✓ 4 = don't know
3.	Risk diversification <i>Do you think the following statement is true or false? Buying shares in a single company usually provides a safer return than buying shares in a mutual fund.</i>	1 = true, 2 = false, ✓ 3 = don't know
4.	Interest compounding <i>Suppose you owe €1,000 on a loan and the interest rate you are charged is 20% per year, compounded annually. If you didn't pay anything off, at this interest rate, how many years would it take for the amount you owe to double?</i>	1 = less than 2 years, ✓ 2 = at least 2 years but less than 5 years, 3 = at least 5 years but less than 10 years, 4 = at least 10 years, 5 = don't know

Table A.4 Trust in the ECB during April 2020 – March 2021, from 0 (no trust at all) to 10 (complete trust)

	Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21	Average
BE	5.37	5.40	5.57	5.45	5.30	5.27	5.32	5.53	5.50	5.37	5.39	5.43	5.41
DE	5.61	5.61	5.72	5.50	5.55	5.69	5.61	5.81	5.71	5.69	5.66	5.77	5.66
ES	4.88	5.19	5.21	5.41	5.38	5.24	5.40	5.42	5.39	5.33	5.17	5.22	5.27
FR	5.46	5.58	5.65	5.75	5.66	5.69	5.79	5.76	5.84	5.61	5.83	5.69	5.69
IT	4.56	4.73	5.05	4.93	5.10	5.09	4.98	5.16	5.15	5.31	5.37	5.21	5.05
NL	5.43	5.36	5.39	5.37	5.43	5.40	5.46	5.55	5.77	5.69	5.61	5.51	5.50
Average	5.20	5.32	5.44	5.41	5.43	5.45	5.46	5.57	5.56	5.52	5.54	5.51	5.45

Source: ECB CES pilot survey. Note: Weighted results. The number of observations is 118,232.

Table A.5 Inflation expectations 3 years ahead, April 2020 – March 2021

		Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21	Average
BE	Mean	3.6	3.6	3.4	3.2	3.4	3.4	3.4	3.4	3.0	2.8	2.8	2.9	3.2
	Median	2.3	2.1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
	% well-anchored	13.3	14.3	13.2	13.1	15.9	15.7	14.8	14.2	17.4	14.8	15.4	16.0	14.9
DE	Mean	3.6	2.6	2.7	2.4	2.5	2.3	2.0	2.2	2.4	2.6	2.5	2.2	2.5
	Median	2.0	1.5	1.8	1.8	2.0	1.5	1.3	1.5	1.8	2.0	2.0	1.8	1.8
	% well-anchored	11.7	10.1	10.7	12.0	13.4	12.2	11.2	12.2	11.7	10.2	10.7	9.8	11.3
ES	Mean	4.4	3.9	3.8	3.7	3.7	3.7	3.2	3.6	3.7	3.6	3.5	3.7	3.7
	Median	2.5	2.4	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
	% well-anchored	9.4	8.9	10.7	9.5	10.5	11.8	12.5	10.8	12.7	12.0	11.4	10.4	10.9
FR	Mean	3.8	3.5	3.3	3.0	3.3	2.8	2.4	2.5	2.5	2.5	2.4	2.5	2.9
	Median	2.0	2.0	1.5	1.5	2.0	1.1	1.0	1.1	1.0	1.1	1.1	1.1	1.2
	% well-anchored	11.8	9.3	9.2	10.4	10.2	9.6	9.2	9.1	8.6	9.7	8.6	9.6	9.6
IT	Mean	5.1	5.2	4.9	4.6	4.8	4.5	4.3	4.3	4.1	3.9	3.9	4.0	4.5
	Median	3.0	3.0	3.0	2.5	3.0	2.3	2.2	2.0	2.0	2.0	2.0	2.0	2.5
	% well-anchored	9.1	9.7	9.1	9.5	9.3	11.4	11.4	9.7	11.4	12.2	12.0	11.2	10.5
NL	Mean	3.3	3.2	3.1	3.0	2.9	2.6	2.8	2.6	2.4	2.7	2.7	2.7	2.9
	Median	2.1	2.2	2.3	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
	% well-anchored	14.2	15.0	13.3	16.7	14.4	15.8	16.4	11.2	14.0	14.1	14.7	12.6	14.5
Average	Mean	4.1	3.7	3.5	3.3	3.4	3.2	2.9	3.0	3.0	3.0	3.0	3.3	3.3
	Median	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
	% well-anchored	11.0	10.1	10.3	11.0	11.5	11.7	11.5	10.8	11.5	11.3	11.1	10.5	11.0

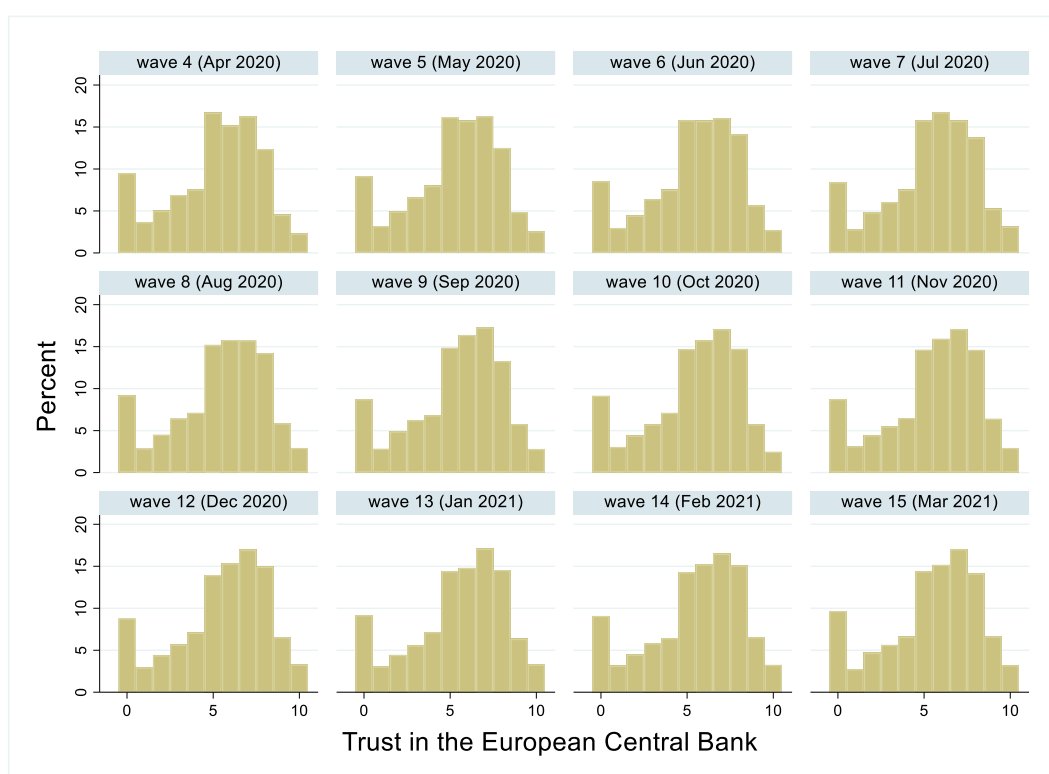
Source: ECB CES pilot survey. Note: Weighted results for the mean and % well-anchored, which is based on the strict definition of [1.8%,2%]. The number of observations is 116,650. Inflation expectations are winsorized at 5%.

Table A.6 Inflation expectations 12 months ahead, April 2020 – March 2021

		Apr-20	May-20	Jun-20	Jul-20	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21	Average
BE	Mean	4.0	3.5	3.4	3.3	3.4	3.4	3.5	3.5	3.1	3.0	2.8	2.8	3.3
	Median	3.0	2.3	2.2	2.2	2.2	2.0	2.0	2.2	2.0	2.0	2.0	2.0	2.0
	% well-anchored	12.0	12.4	12.1	12.9	14.7	15.9	15.7	15.4	18.1	15.1	16.5	15.8	14.7
DE	Mean	3.7	3.3	2.7	2.5	2.6	2.6	2.3	2.4	2.4	2.5	2.8	2.7	2.7
	Median	2.0	2.0	1.6	1.5	2.0	1.8	1.5	1.8	1.5	2.0	2.0	2.0	2.0
	% well-anchored	8.6	9.0	9.4	8.6	10.8	10.7	12.5	10.3	9.3	11.1	12.7	12.6	10.5
ES	Mean	4.0	3.9	3.7	3.8	3.4	3.3	3.2	3.5	3.3	3.4	3.3	3.3	3.5
	Median	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
	% well-anchored	7.5	9.6	10.8	9.8	9.0	10.7	10.9	10.6	12.7	11.0	10.1	11.8	10.4
FR	Mean	4.1	4.2	3.6	3.2	3.4	2.9	2.6	2.7	2.5	2.6	2.3	2.5	3.1
	Median	2.5	2.5	2.0	2.0	2.0	1.5	1.1	1.5	1.1	1.0	1.0	1.0	1.5
	% well-anchored	9.6	9.5	11.4	9.7	9.0	9.9	8.4	9.5	9.7	8.6	8.8	9.3	9.5
IT	Mean	5.6	5.9	5.6	4.9	4.6	4.2	4.3	4.4	4.0	3.7	3.7	3.8	4.6
	Median	4.1	5.0	5.0	3.0	3.0	2.2	3.0	3.0	2.0	2.0	2.0	2.0	3.0
	% well-anchored	6.5	9.6	9.8	9.7	9.6	10.3	10.5	9.8	9.9	12.1	11.9	14.7	10.4
NL	Mean	3.5	3.6	3.5	3.4	3.0	2.8	3.1	2.9	2.5	2.6	2.7	2.7	3.0
	Median	2.5	2.9	2.5	2.5	2.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
	% well-anchored	11.2	12.3	12.9	15.8	14.6	15.6	14.8	15.2	15.0	15.6	14.8	16.9	14.6
Average	Mean	4.3	4.2	3.8	3.5	3.4	3.2	3.1	3.2	3.0	3.0	2.9	3.0	3.4
	Median	2.5	2.5	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
	% well-anchored	8.5	9.7	10.5	9.9	10.2	10.9	11.2	10.5	10.8	11.2	11.5	12.6	10.6

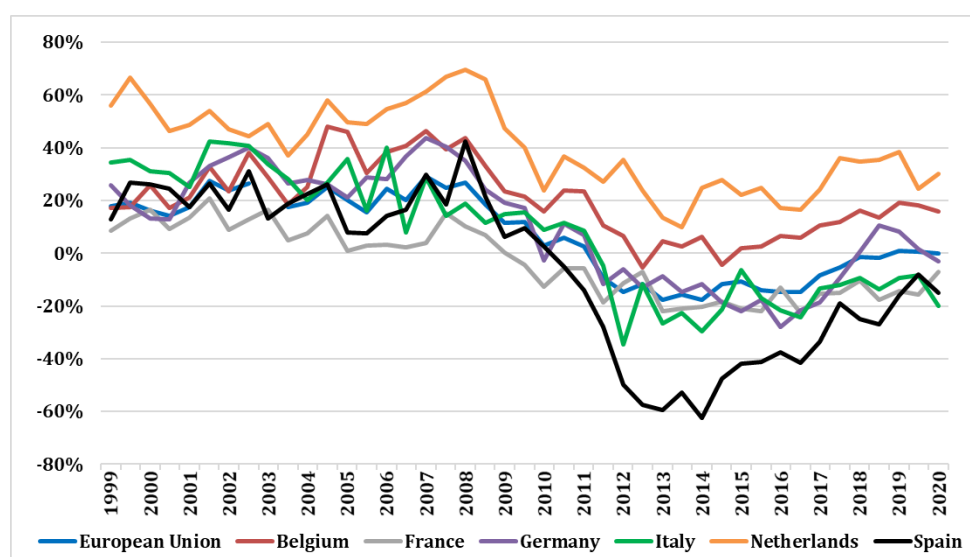
Source: ECB CES pilot survey. Note: Weighted results for the mean and % well-anchored, which is based on the strict definition of [1.8%,2%]. The number of observations is 121,797. Inflation expectations are winsorized at 5%.

Figure A.1 Trust in the ECB, by wave



Source: ECB CES pilot survey, unweighted results.

Figure A.2 Trust in the ECB. Share "tend to trust"- share "tend not to trust"



Source: Eurobarometer. 1999-summer 2020.

Appendix B. Robustness checks

Table B.1 Robustness checks: determinants of trust in the ECB

	(1) Ordered probit	(2) Trust in the ECB>0
<i>COVID-19: hours worked increased</i>	-0.003 (0.015)	-0.021 (0.019)
<i>COVID-19: hours worked decreased</i>	-0.060*** (0.011)	-0.089*** (0.014)
<i>Male</i>	0.174*** (0.025)	0.218*** (0.029)
<i>Age 35-54</i>	-0.250*** (0.031)	-0.254*** (0.034)
<i>Age 55-70</i>	-0.137*** (0.035)	-0.210*** (0.040)
<i>Age 71 and over</i>	0.053 (0.065)	-0.059 (0.077)
<i>Education</i>	0.086*** (0.017)	0.068*** (0.020)
<i>Income: below €20,000</i>	-0.333*** (0.034)	-0.296*** (0.038)
<i>Income: €40,000-59,999</i>	0.223*** (0.035)	0.252*** (0.040)
<i>Income: above €60,000</i>	0.358*** (0.045)	0.395*** (0.052)
<i>Income unknown</i>	-0.185*** (0.042)	-0.101** (0.048)
<i>Homeowner without mortgage</i>	0.115*** (0.029)	0.116*** (0.033)
<i>Employed</i>	-0.023 (0.028)	-0.048 (0.032)
<i>Self-assessed financial knowledge</i>	0.065*** (0.017)	0.089*** (0.019)
<i>BE</i>	-0.346*** (0.046)	-0.289*** (0.053)
<i>ES</i>	-0.265*** (0.039)	-0.209*** (0.045)
<i>FR</i>	0.002 (0.035)	0.093** (0.041)
<i>IT</i>	-0.460*** (0.043)	-0.379*** (0.049)
<i>NL</i>	-0.172*** (0.047)	-0.237*** (0.056)
Number of observations	118,221	107,564
Number of respondents	18,265	17,459
Wald χ^2	1,254.0***	1,053.2***

Notes: The table shows the results of a random effects ordered probit regression (column 1) and a random effects panel regression (column 2), with standard errors clustered at the individual level (in parentheses). The dependent variable is trust in the ECB. Constant and wave dummies are included (not shown). ***, **, * denote significance at 1%, 5%, and 10% level, respectively.

Table B.2 Estimation results for impact of trust in the ECB on anchoring of inflation expectations 3 years ahead: IV regressions

	Well-anchored, strict: [1.8%; 2.0%]		Well-anchored, loose: [1.5%; 2.0%]		Inflation expectations gap	
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Trust in the ECB</i>	0.003 (0.002)	0.003 (0.002)	0.005** (0.002)	0.005** (0.002)	-0.174*** (0.011)	-0.173*** (0.011)
<i>Male</i>	0.134*** (0.010)	0.094*** (0.010)	0.178*** (0.009)	0.130*** (0.010)	-0.617*** (0.043)	-0.500*** (0.042)
<i>Age 35-54</i>	0.142*** (0.014)	0.121*** (0.014)	0.170*** (0.013)	0.145*** (0.013)	0.091* (0.053)	0.152*** (0.053)
<i>Age 55-70</i>	0.199*** (0.015)	0.158*** (0.015)	0.262*** (0.014)	0.210*** (0.014)	0.074 (0.060)	0.200*** (0.060)
<i>Age 71 and over</i>	0.129*** (0.027)	0.095*** (0.028)	0.212*** (0.025)	0.170*** (0.025)	0.026 (0.107)	0.130 (0.106)
<i>Education</i>	0.084*** (0.008)	0.057*** (0.008)	0.096*** (0.007)	0.064*** (0.007)	-0.166*** (0.032)	-0.080** (0.032)
<i>Income: below €20,000</i>	-0.088*** (0.014)	-0.085*** (0.014)	-0.104*** (0.013)	-0.101*** (0.013)	0.601*** (0.063)	0.587*** (0.063)
<i>Income: €40,000-59,999</i>	0.062*** (0.014)	0.041*** (0.014)	0.068*** (0.013)	0.045*** (0.013)	-0.125** (0.055)	-0.062 (0.054)
<i>Income: above €60,000</i>	0.152*** (0.017)	0.110*** (0.017)	0.217*** (0.015)	0.171*** (0.016)	-0.285*** (0.068)	-0.142** (0.066)
<i>Income unknown</i>	-0.053*** (0.017)	-0.053*** (0.017)	-0.058*** (0.016)	-0.058*** (0.016)	0.210*** (0.074)	0.197*** (0.074)
<i>Homeowner without mortgage</i>	0.048*** (0.011)	0.037*** (0.011)	0.052*** (0.010)	0.040*** (0.011)	-0.262*** (0.050)	-0.227*** (0.049)
<i>Employed</i>	0.038*** (0.012)	0.026** (0.012)	0.024** (0.011)	0.010 (0.011)	-0.180*** (0.052)	-0.135*** (0.051)
<i>Self-assessed financial knowledge</i>	0.057*** (0.007)		0.095*** (0.006)		-0.075*** (0.028)	
<i>Actual financial knowledge</i>		0.140*** (0.005)		0.181*** (0.005)		-0.360*** (0.021)
<i>BE</i>	0.188*** (0.018)	0.197*** (0.018)	0.159*** (0.017)	0.177*** (0.017)	0.222*** (0.074)	0.238*** (0.072)
<i>ES</i>	0.030* (0.016)	0.065*** (0.016)	-0.031** (0.015)	0.017 (0.015)	0.864*** (0.065)	0.805*** (0.064)
<i>FR</i>	-0.127*** (0.016)	-0.086*** (0.017)	-0.164*** (0.015)	-0.110*** (0.015)	0.504*** (0.053)	0.405*** (0.052)
<i>IT</i>	-0.044*** (0.016)	-0.056*** (0.017)	-0.145*** (0.015)	-0.163*** (0.015)	1.536*** (0.071)	1.566*** (0.070)
<i>NL</i>	0.157*** (0.019)	0.149*** (0.019)	0.197*** (0.018)	0.201*** (0.017)	-0.409*** (0.068)	-0.317*** (0.064)
Marginal effect: Trust in the ECB	0.345 (0.226)	0.278 (0.227)	0.534*** (0.209)	0.454 ** (0.211)		
Marginal effect: Financial knowledge	5.683*** (0.654)	13.977 *** (0.508)	9.507*** (0.604)	18.133*** (0.473)		
Number of observations	112,218	112,228	112,218	112,228	112,218	112,228
Number of respondents	18,062	18,063	18,062	18,063	18,062	18,063
First-stage regression F-test	10095.27	10078.24	10095.27	10078.24	38335.71	38010.79
P-value	0.00	0.00	0.00	0.00	0.00	0.00
Endogeneity test	4.94	2.46	18.59	12.57	19.657	29.057
P-value	0.03	0.12	0.00	0.00	0.00	0.00
Test of overidentifying restrictions	0.014	0.030	0.412	0.057	0.646	0.201
P-value	0.91	0.86	0.52	0.81	0.42	0.65

Notes: The table shows the estimation results of IV probit (columns 1-4) and IV regressions (columns 5-6): coefficients, with clustered standard errors (in parentheses). The dependent variables are *well-anchored inflation expectations 3 years: strict* and *well-anchored inflation expectations 3 years: loose*, which are 1 for respondents with well-anchored inflation expectations and 0 for other respondents. Trust in the ECB is instrumented with two variables: trust in the EP and trust in the EC. Constant and wave dummies are included (not shown). ***, **, * denote significance at 1%, 5%, and 10% level, respectively.

Appendix C. Results with short-term inflation expectations

Table C.1 Estimation results: impact of trust in the ECB on anchoring of inflation expectations 12 months ahead

	Well-anchored, strict: [1.8%; 2.0%]		Well-anchored, loose: [1.5%; 2.0%]		Inflation expectations gap	
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Trust in the ECB</i>	-0.001 (0.003)	-0.002 (0.003)	0.001 (0.003)	0.000 (0.003)	-0.056*** (0.005)	-0.056*** (0.005)
<i>Male</i>	0.089*** (0.019)	0.046** (0.019)	0.142*** (0.018)	0.091*** (0.018)	-0.633*** (0.043)	-0.514*** (0.043)
<i>Age 35-54</i>	0.106*** (0.024)	0.085*** (0.024)	0.135*** (0.023)	0.109*** (0.023)	0.101* (0.054)	0.155*** (0.053)
<i>Age 55-70</i>	0.210*** (0.027)	0.166*** (0.027)	0.274*** (0.026)	0.218*** (0.026)	-0.056 (0.061)	0.069 (0.060)
<i>Age 71 and over</i>	0.199*** (0.049)	0.157*** (0.049)	0.297*** (0.048)	0.242*** (0.047)	-0.431*** (0.112)	-0.302*** (0.111)
<i>Education</i>	0.072*** (0.013)	0.037*** (0.014)	0.101*** (0.013)	0.058*** (0.013)	-0.232*** (0.032)	-0.124*** (0.032)
<i>Income: below €20,000</i>	-0.093*** (0.025)	-0.089*** (0.025)	-0.090*** (0.024)	-0.085*** (0.024)	0.487*** (0.061)	0.468*** (0.061)
<i>Income: €40,000-59,999</i>	0.045* (0.027)	0.022 (0.027)	0.044* (0.026)	0.017 (0.026)	-0.274*** (0.056)	-0.212*** (0.055)
<i>Income: above €60,000</i>	0.110*** (0.032)	0.055* (0.032)	0.213*** (0.031)	0.148*** (0.031)	-0.441*** (0.068)	-0.257*** (0.067)
<i>Income unknown</i>	-0.076** (0.031)	-0.075** (0.031)	-0.056* (0.030)	-0.056* (0.030)	0.201*** (0.073)	0.183** (0.073)
<i>Homeowner without mortgage</i>	0.023 (0.021)	0.011 (0.021)	0.045** (0.020)	0.032 (0.020)	-0.292*** (0.049)	-0.263*** (0.048)
<i>Employed</i>	0.069*** (0.021)	0.053** (0.021)	0.054*** (0.020)	0.035* (0.020)	-0.372*** (0.049)	-0.317*** (0.049)
<i>Self-assessed financial knowledge</i>	0.042*** (0.012)		0.073*** (0.012)		-0.029 (0.029)	
<i>Actual financial knowledge</i>		0.143*** (0.009)		0.184*** (0.009)		-0.370*** (0.020)
<i>BE</i>	0.263*** (0.034)	0.263*** (0.034)	0.236*** (0.033)	0.242*** (0.033)	0.030 (0.073)	0.074 (0.072)
<i>ES</i>	0.016 (0.029)	0.045 (0.029)	-0.035 (0.028)	0.007 (0.028)	0.714*** (0.068)	0.673*** (0.067)
<i>FR</i>	-0.119*** (0.030)	-0.077*** (0.030)	-0.168*** (0.029)	-0.112*** (0.028)	0.497*** (0.061)	0.404*** (0.061)
<i>IT</i>	-0.025 (0.030)	-0.039 (0.029)	-0.146*** (0.029)	-0.164*** (0.029)	1.397*** (0.072)	1.450*** (0.071)
<i>NL</i>	0.260*** (0.036)	0.235*** (0.035)	0.312*** (0.034)	0.295*** (0.033)	-0.559*** (0.073)	-0.419*** (0.070)
Number of observations	118,196	118,207	118,196	118,207	118,196	118,207
Number of respondents	18,258	18,259	18,258	18,259	18,258	18,259
Wald χ^2	515.2***	742.4***	1,053.3***	1,414.4***	3,323.7***	3,327.7***

Notes: The table shows the estimation results of random effects probit regressions in columns (1)-(4) and random effects panel regressions in columns (5)-(6): coefficients, with clustered standard errors (in parentheses). The dependent variables in columns (1)-(4) are *well-anchored inflation expectations 12 months: strict* and *well-anchored inflation expectations 12 months: loose*, respectively, which are 1 for respondents with well-anchored inflation expectations and 0 for others. The dependent variable in columns (5)-(6) is *inflation expectations gap 12 months*. Constant and wave dummies are included (not shown). ***, **, * denote significance at 1%, 5%, and 10% level, respectively.

Table C.2 Inflation expectations 12 months ahead and spending intentions

	<i>Intention to buy a large item</i>		<i>Expected household spending</i>	
	(1)	(2)	(3)	(4)
<i>Inflation expectations 12 months, quantitative</i>	0.007*** (0.001)		0.029*** (0.001)	
<i>Inflation expectations 12 months, qualitative</i>		0.026*** (0.007)		0.158*** (0.006)
<i>Male</i>	0.097*** (0.021)	0.094*** (0.021)	0.037** (0.015)	0.032** (0.015)
<i>Age 35-54</i>	-0.284*** (0.026)	-0.285*** (0.026)	0.096*** (0.018)	0.085*** (0.018)
<i>Age 55-70</i>	-0.384*** (0.030)	-0.386*** (0.030)	0.171*** (0.020)	0.149*** (0.020)
<i>Age 71 and over</i>	-0.526*** (0.056)	-0.529*** (0.056)	0.206*** (0.036)	0.181*** (0.036)
<i>Education</i>	0.098*** (0.014)	0.096*** (0.014)	-0.010 (0.010)	-0.016 (0.010)
<i>Income: below €20,000</i>	-0.105*** (0.028)	-0.103*** (0.028)	0.028 (0.020)	0.034* (0.020)
<i>Income: €40,000-59,999</i>	0.152*** (0.030)	0.151*** (0.030)	0.040** (0.020)	0.033* (0.020)
<i>Income: above €60,000</i>	0.502*** (0.039)	0.500*** (0.039)	0.078*** (0.026)	0.063** (0.026)
<i>Income unknown</i>	-0.258*** (0.034)	-0.258*** (0.034)	0.033 (0.024)	0.032 (0.024)
<i>Homeowner without mortgage</i>	-0.066*** (0.024)	-0.067*** (0.024)	-0.070*** (0.016)	-0.072*** (0.016)
<i>Employed</i>	0.134*** (0.023)	0.133*** (0.023)	-0.056*** (0.016)	-0.057*** (0.016)
<i>Self-assessed financial knowledge</i>	0.166*** (0.013)	0.165*** (0.013)	0.037*** (0.010)	0.030*** (0.010)
<i>Liquidity unconstrained</i>	0.658*** (0.018)	0.657*** (0.018)	0.132*** (0.013)	0.128*** (0.013)
Number of observations	111,410	111,410	121,786	121,786
Number of respondents	18,375	18,375	18,482	18,482
Wald χ^2	3,145.5***	3,147.4***	1,335.4***	1,503.5***
Model	Random effects probit		Random effects ordered probit	

Notes: The table shows the estimation results of random effects probit regressions (columns 1-2) and random effects ordered probit regressions (columns 3-4): coefficients, with clustered standard errors (in parentheses). The dependent variable in columns 1-2 is *intention to buy a large item*, which is 1 if for respondents who want to buy a major item in the next 12 months and 0 for other respondents. The dependent variable in columns 3-4 is *expected household spending*, which ranges from 1 'decrease a lot' to 5 'increase a lot'. Constant, country-specific, and wave dummies are included (not shown). ***, **, * denote significance at 1%, 5%, and 10% level, respectively.

DeNederlandscheBank

EUROSYSTEEM

De Nederlandsche Bank N.V.
Postbus 98, 1000 AB Amsterdam
020 524 91 11
dnb.nl